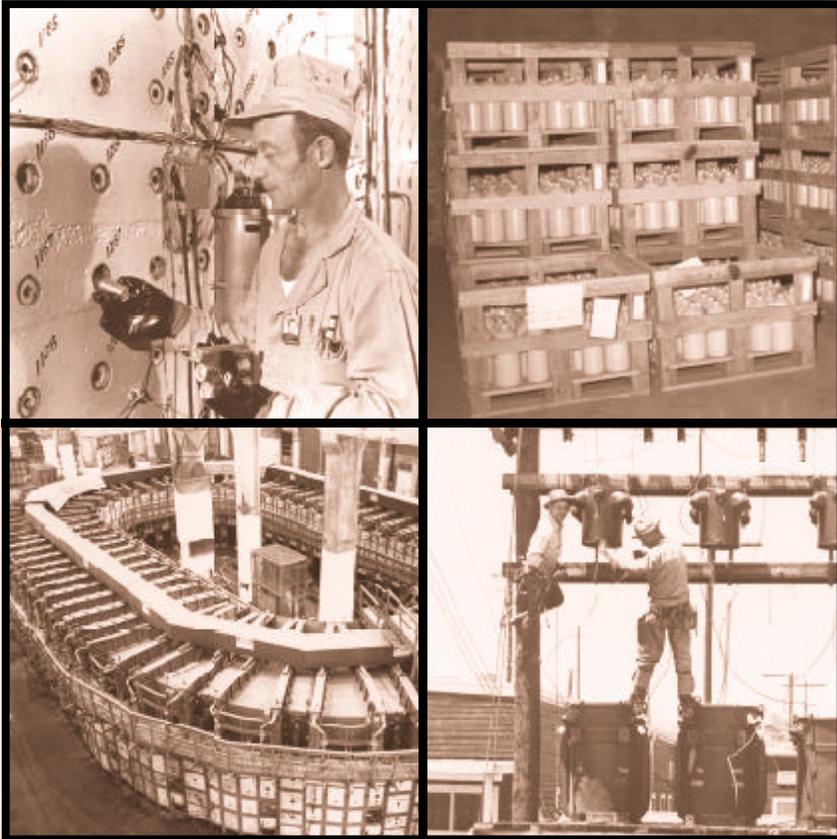


REPORTS OF THE OAK RIDGE DOSE RECONSTRUCTION, Vol. 1A  
The Report of Project Task 1 • July 1999

**Iodine-131 Releases from Radioactive Lanthanum Processing  
at the X-10 Site in Oak Ridge, Tennessee (1944-1956) –  
an Assessment of Quantities Released, Off-Site Radiation Doses,  
and Potential Excess Risks of Thyroid Cancer  
– APPENDICES –**



Submitted to the Tennessee Department of Health by



**OAK RIDGE HEALTH STUDIES  
OAK RIDGE DOSE RECONSTRUCTION**

**- TASK 1 REPORT -**

**IODINE-131 RELEASES FROM RADIOACTIVE LANTHANUM  
PROCESSING AT THE X-10 SITE IN OAK RIDGE, TENNESSEE  
(1944-1956) - AN ASSESSMENT OF QUANTITIES RELEASED,  
OFF-SITE RADIATION DOSES, AND POTENTIAL  
EXCESS RISKS OF THYROID CANCER**

***VOLUME 1A- APPENDICES***

July 1999

Submitted to the Tennessee Department of Health by  
McLaren/Hart-ChemRisk

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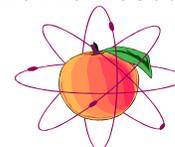
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**APPENDICES (Volume 1A)**

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**APPENDIX 2A**

**DETAILED MATHEMATICAL APPROACH**

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## APPENDIX 2-A: DETAILED MATHEMATICAL APPROACH

This study analyzes exposures to <sup>131</sup>I released from the X-10 facility due to ingestion of milk and cheese, leafy vegetables, meat, and eggs and from direct inhalation of contaminated air. A total of eight ingestion pathways have been analyzed: milk from backyard cows, milk from commercial sources, goat's milk, mother's milk, beef, leafy vegetables, cheese, and eggs. In addition, exposure through inhalation of contaminated air and exposure of a fetus via ingestion of <sup>131</sup>I by the mother are also analyzed. This appendix presents the equations used to estimate the total excess lifetime risks of thyroid cancer and the thyroid doses for the routine releases and for the 1954 accident, starting with <sup>131</sup>I concentrations in air.

Individuals living near X-10 may have been exposed by more than one pathway at a time. Inhalation of contaminated air, for instance, is an exposure pathway that affected everyone in the contaminated areas. Three special exposure scenarios are designed to match the most likely dietary habits and lifestyles in the vicinity of the Oak Ridge Reservation. The first exposure scenario refers to individuals living in a "rural farm" setting (i.e., they own land and livestock; thus, they produce their own "backyard" cow's milk, cheese, vegetables and eggs). The second exposure scenario refers to individuals in a rural area who do not own their own dairy cows. However, they have some land and produce their own vegetables and eggs, and they purchase the necessary milk and cheese from farms located nearby. The third scenario refers to individuals in a more "urban" setting, who do not produce their own food products. These individuals buy milk and food products from the grocery store.

The total intake of <sup>131</sup>I for each exposure pathway is calculated according to the equations described in the following sections. From the intake via each pathway, or from the total intake for combined pathways, the dose and risk are calculated as follows:

$$D = \sum_{i=N_1}^{N_2} INT_i \cdot DCF_i \quad (2-A.1)$$

and

$$TEL_R = \sum_{i=N_1}^{N_2} INT_i \cdot DCF_i \cdot RF_i \quad (2-A.2)$$

where

- $D$  = dose to the thyroid due to intake of <sup>131</sup>I [Gy];
- $TEL_R$  = total excess lifetime risk of thyroid cancer due to intake of <sup>131</sup>I [unitless];
- $N_1$  = age at which exposure began;
- $N_2$  = age at which exposure ended;
- $INT_i$  = age ( $i$ )-dependent intake of <sup>131</sup>I [Bq];
- $DCF_i$  = thyroid dose per unit intake at age  $i$  (dose factor) [Gy Bq<sup>-1</sup>] (Section 9);
- $RF_i$  = the risk factor = excess lifetime risk of thyroid cancer per unit dose from exposure at age  $i$  [Gy<sup>-1</sup>] (Section 10); and
- $i$  = age of the individual ( $i = 0,1,2,\dots$ ) in year of release  $j$ .

The dose and risks are calculated separately for routine releases of <sup>131</sup>I that occurred from 1944 to 1956 and for the <sup>131</sup>I released from the April 29, 1954, accident. The amount of <sup>131</sup>I released from X-10 during the accident is small compared to the total amount of <sup>131</sup>I released during the entire year 1954. Thus, in the case called "routine releases," the source term for 1954 includes both the amount of <sup>131</sup>I released during the 1954 accident and the amount released continuously during the rest of 1954. Thus, the doses and risks estimated for "routine releases" represent the health impact from the entire amount of <sup>131</sup>I released from the RaLa facility.

### 2-A.1 Ingestion of Contaminated Milk

The approach described below applies to milk collected from backyard cows, commercial cows, and goats.

#### Routine releases

The generic equations used to estimate the intake of <sup>131</sup>I from the ingestion of contaminated milk are listed below.

$$INT_{milk,i} = C_{mma,j} \cdot MD \cdot U_{m,i} \cdot \Delta t \quad (2-A.3)$$

and

$$C_{mma,j} = \sum_{k=1}^3 C_{aa,j,k} \cdot AP_k \cdot PM \quad (2-A.4)$$

where

- $INT_{milk,i}$  = intake of <sup>131</sup>I due to ingestion of contaminated milk for an individual of age  $i$  [Bq];
- $C_{mma,j}$  = the annual average concentration of <sup>131</sup>I in milk at milking in year  $j$  [Bq L<sup>-1</sup><sub>milk</sub>];
- $j$  = year of release:  $j = 1944 + i$ , for an individual born in 1944;  
=  $1952 + i$ , for an individual born in 1952, etc;
- $MD$  = milk distribution factor [unitless] (Section 7);
- $U_{m,i}$  = age ( $i$ )-dependent milk ingestion rate [L d<sup>-1</sup>] (Sect. 8);
- $D$  = the time period corresponding to year  $j$  [365d];
- $k$  = index for the physico-chemical forms of iodine present in air above a pasture:  $k = 1$  - elemental,  $k = 2$  - particulate iodine,  $k = 3$  - nonreactive form (assumed to be organic iodine);
- $C_{aa,j,k}$  = annual average concentration in air of physico-chemical form  $k$  [Bq m<sup>-3</sup><sub>air</sub>] (Section 4);
- $AP_k$  = air-pasture transfer factor for physico-chemical form  $k$  [Bq kg<sup>-1</sup><sub>dry mass</sub> per Bq m<sup>-3</sup><sub>air</sub>] (Section 5); and
- $PM$  = the pasture-to-milk transfer factor [Bq L<sup>-1</sup><sub>milk</sub> per Bq kg<sup>-1</sup><sub>dry mass</sub>] (Sect. 6).

The solution to Equation 2-A.4 is dependent on the air-to-pasture transfer factor ( $AP_k$ ) for each chemical form of  $^{131}\text{I}$ ;  $AP_k$  represents the ratio of annual average concentration of form  $k$  in the pasture to that in air. Further discussions of individual parameters in Equations 2-A.3 and 2-A.4 are presented in the relevant sections of the main text of this report.

## 1954 Accident

For the accidental release, the intake of  $^{131}\text{I}$  from the ingestion of contaminated milk is estimated from the following equations.

$$INT_{milk,i} = C_{mm,T} \cdot MD_A \cdot U_{m,i,A} \quad (2-A.5)$$

$$C_{mm,T} = \int_0^T C_{mm}(t) dt \quad (2-A.6)$$

where

- $C_{mm,T}$  = the time-integrated concentration of  $^{131}\text{I}$  in milk at the time of milking [ $\text{Bq} \cdot \text{d} \cdot \text{L}^{-1}_{milk}$ ];
- $MD_A$  = milk distribution factor applicable during the accident [unitless];
- $U_{m,i,A}$  = age ( $i$ )-dependent milk ingestion rate at the time of the accident [ $\text{L} \cdot \text{d}^{-1}$ ] (Section 8);
- $C_{mm}(t)$  = the concentration of  $^{131}\text{I}$  in milk at time  $t$  after the accident [ $\text{Bq} \cdot \text{L}^{-1}_{milk}$ ].

Further discussions of individual parameters in Equations 2-A.4 through 2-A.6 are presented in the relevant sections of the main text of this report.

## 2-A.2 Ingestion of Contaminated Beef

### Routine Releases

In this study, beef is considered a surrogate for various types of meat. Since meat is generally stored after slaughtering for a period of time longer than the half-life of  $^{131}\text{I}$ , consumption of contaminated meat is not expected to be an important contributor to the total dose and risk. The modeling approach for the ingestion of beef is similar to that for the ingestion of milk as shown in the following equations:

$$INT_{beef,i} = C_{f_{sa,j}} \cdot FD \cdot U_{f,i} \cdot \Delta t \quad (2-A.7)$$

$$C_{f_{sa,j}} = \sum_{k=1}^3 C_{aa,j,k} \cdot AP_k \cdot PF \quad (2-A.8)$$

where

- $INT_{beef,i}$  = intake of  $^{131}\text{I}$  due to ingestion of contaminated beef for an individual of age  $i$  [Bq];
- $C_{fsa,j}$  = the annual average concentration of  $^{131}\text{I}$  in beef at slaughtering in year ( $j$ ) [ $\text{Bq kg}^{-1}_{\text{beef}}$ ];
- $FD$  = beef distribution factor [unitless] (Section 7);
- $U_{f,i}$  = age ( $i$ )-dependent beef ingestion rate [ $\text{kg d}^{-1}$ ] (Section 8);
- $D$  = the time period corresponding to year  $j$  [365d];
- $C_{aa,j,k}$  = annual average concentration in air of physico-chemical form  $k$  [ $\text{Bq m}^{-3}_{\text{air}}$ ] (Section 4);
- $AP_k$  = transfer factor of  $^{131}\text{I}$  from air to pasture grass for the physico-chemical form  $k$ , [ $\text{Bq kg}^{-1}_{\text{dry mass}}$  per  $\text{Bq m}^{-3}_{\text{air}}$ ] (Section 5); and
- $PF$  = the pasture-to-beef transfer factor [ $\text{Bq kg}^{-1}$  per  $\text{Bq kg}^{-1}_{\text{dry mass}}$ ] (Section 6).

Further discussions of individual parameters in Equations 2-A.7 through 2-A.8 are presented in the relevant sections of the main text of this report.

## 1954 Accident

In the areas around the Oak Ridge Reservation, slaughtering of cattle is usually done in the fall, rather than spring, because the farmers use the cold weather to ensure that the meat does not spoil. The time between the accident in April 1954 and the normal period for cattle slaughtering was long enough that all of the  $^{131}\text{I}$  would have decayed away. Therefore, doses and risks from the ingestion of beef are not relevant for the analysis of the 1954 accident.

## 2-A.3 Ingestion of Contaminated Leafy Vegetables

### Routine Releases

Contamination of “leafy” vegetables might be high because of the large surface of leaf exposed to the contaminated cloud. However, contamination is substantially reduced by washing and cooking. In addition, fresh vegetables are seasonal food products and are a source of exposure only during the harvest period. The governing equations for the estimation of  $^{131}\text{I}$  intake from the ingestion of contaminated leafy vegetables are as follows:

$$INT_{leafy,i} = C_{vha,j} \cdot LD_i \cdot U_{L,i} \cdot \Delta t \quad (2-A.9)$$

$$C_{vha,j} = \sum_{k=1}^3 C_{aa,j,k} \cdot AV_k \quad (2-A.10)$$

where

- $INT_{leafy,i}$  = intake of  $^{131}\text{I}$  due to ingestion of contaminated leafy vegetables for an individual of age  $i$  [Bq];
- $C_{vha,j}$  = the annual average concentration of  $^{131}\text{I}$  in leafy vegetables at harvesting in year ( $j$ ) [ $\text{Bq kg}^{-1}_{\text{fresh mass}}$ ];
- $LD_i$  = leafy vegetables distribution factor [unitless] (Section 7);

- $U_{f,i}$  = age ( $i$ )-dependent leafy vegetation ingestion rate [ $\text{kg}_{\text{fresh mass}} \text{d}^{-1}$ ] (Section 8);
- $D$  = the time period corresponding to year  $j$  [365d];
- $C_{aa,j,k}$  = annual average concentration in air of physico-chemical form  $k$  [ $\text{Bq m}^{-3}_{\text{air}}$ ] (Section 4); and
- $AV_k$  = the air-to-vegetables transfer factor [ $\text{Bq kg}^{-1}_{\text{fresh mass}}$  per  $\text{Bq m}^{-3}$ ] for physico-chemical form  $k$  (Section 5).

## 1954 Accident

The approach for the 1954 accident is similar to that presented in Section 2-A.1 for milk. The intake of  $^{131}\text{I}$  from ingestion of leafy vegetables contaminated during 1954 accident is calculated as

$$INT_{\text{leafy},i} = C_{v,T} \cdot LD_A \cdot U_{L,i,A} \quad (2-A.11)$$

where

- $C_{v,T}$  = the time-integrated concentration of  $^{131}\text{I}$  in leafy vegetables at the time of harvesting [ $\text{Bq d kg}^{-1}_{\text{fresh mass}}$ ];
- $LD_A$  = leafy vegetable distribution factor applicable during the accident [dimensionless]; and
- $U_{L,i,A}$  = age ( $i$ )-dependent leafy vegetable ingestion rate at the time of the accident [ $\text{kg}_{\text{fresh mass}} \text{d}^{-1}$ ].

The time-integrated concentration ( $C_{v,T}$ ) is obtained by integrating the concentration of  $^{131}\text{I}$  in vegetables ( $C_v(t)$ ) as a function of time after the accident. Further discussions of individual parameters in Equations 2-A.9 and 2-A.11 are presented in the relevant sections of the main text of this report.

### 2-A.4 Ingestion of Contaminated Eggs

Iodine-131 can accumulate in eggs if chickens are fed contaminated feed. In general, chicken feed is stored for periods of time longer than the half-life of  $^{131}\text{I}$ . If chickens are allowed to roam freely, however, they may consume small amounts of contaminated grass or soil. In this case, some  $^{131}\text{I}$  is transferred to eggs. However, it has previously been shown that the dose from ingestion of contaminated eggs is much smaller than the dose from the ingestion of contaminated milk for similar concentrations of iodine in air, because of both the smaller amounts of eggs ingested as compared to the ingestion of fresh milk and the longer storage time of eggs (NCI, 1997). Therefore, a less realistic modeling approach was used in the present study. It is assumed that all eggs consumed by an individual are produced locally and therefore are contaminated. Eggs purchased from remote locations are either less contaminated with releases from X-10 or are stored for longer periods of time than the locally produced eggs. Thus, this approach eliminates the need to fully understand the local distribution system for eggs. Also, this approach is based on the observation that the concentration of  $^{131}\text{I}$  in eggs is similar to that in cow's milk for a given deposition density of  $^{131}\text{I}$  (NCI, 1997). Therefore, the concentration in

cows' milk is used as a surrogate for the concentration in eggs. For routine releases, the following equation applies:

$$INT_{eggs,i} = C_{mma,j} \cdot F_{gg} \cdot e^{-I_R T_{gg}} \cdot U_{egg,i} \cdot \Delta t \quad (2-A.12)$$

where

- $INT_{eggs,i}$  = intake of <sup>131</sup>I due to ingestion of contaminated eggs for an individual of age  $i$  [Bq];
- $C_{mma,j}$  = the annual average concentration in milk at milking in year  $j$  [Bq L<sup>-1</sup><sub>milk</sub>];
- $F_{gg}$  = parameter that accounts for the uncertainty in the assumption that the concentration in milk is a surrogate for the concentration in eggs; it is defined as the ratio between the average concentration in eggs and average concentration in milk for the same area deposition [L kg<sup>-1</sup>] (Section 7);
- $I_R$  = the radionuclide decay constant for <sup>131</sup>I [0.0862 d<sup>-1</sup>];
- $T_{gg}$  = delay between harvest and consumption of eggs [d] (Section 7);
- $U_{egg,i}$  = age ( $i$ )-dependent egg ingestion rate [kg d<sup>-1</sup>] (Section 8); and
- $D$  = the time period corresponding to year  $j$  [365d].

Similarly, the following governing equation can be used for estimating the intake from the 1954 accident:

$$INT_{eggs,i} = C_{mm,T} \cdot F_{gg} \cdot e^{-I_R T_{gg}} \cdot U_{eggA,i} \quad (2-A.13)$$

where

- $C_{mm,T}$  = the time-integrated concentration of <sup>131</sup>I in milk at the time of milking [Bq·d L<sup>-1</sup><sub>milk</sub>]; and
- $U_{eggA,i}$  = age ( $i$ )-dependent egg ingestion rate [kg d<sup>-1</sup>] at the time of the accident (Section 8).

Further discussions of individual parameters in Equations 2-A.12 through 2-A.13 are presented in the relevant sections of the main text of this report.

### 2-A.5 Ingestion of Contaminated Cheese

Cheese produced from contaminated milk contains some amounts of <sup>131</sup>I. Cheese is stored for longer times and is consumed in much lower quantities than milk. Contribution of cheese ingestion to the total dose and total excess lifetime risk has been found to be very small (NCI, 1997). Therefore, a less detailed approach was chosen for this exposure pathway. The simplifying assumptions are (a) only ingestion of cottage cheese is considered in this study because this type of cheese is usually consumed shortly after it is produced<sup>1</sup>, and (b) the entire amount of cheese consumed by an exposed individual is produced locally. For the routine releases, the intake of <sup>131</sup>I is estimated using the following equation:

<sup>1</sup> Other types of “hard” cheese are stored for longer periods of time that allow <sup>131</sup>I to decay away.

$$INT_{cc,i} = C_{mma,j} \cdot F_{cc} \cdot e^{-1_R T_{cc}} \cdot U_{cc,i} \cdot \Delta t \quad (2-A.14)$$

where

- $INT_{cc,i}$  = intake of <sup>131</sup>I due to ingestion of contaminated cottage cheese for an individual of age  $i$  [Bq];  
 $C_{mma,j}$  = the annual average concentration in milk at milking in year  $j$  [Bq L<sup>-1</sup><sub>milk</sub>];  
 $F_{cc}$  = factor accounting for the transfer of <sup>131</sup>I from milk to cheese [Bq kg<sup>-1</sup> per Bq L<sup>-1</sup>] (Section 6);  
 $1_R$  = the radionuclide decay constant for <sup>131</sup>I [0.0862 d<sup>-1</sup>];  
 $T_{cc}$  = delay between production and consumption of cheese [d] (Section 7);  
 $U_{cc,i}$  = age ( $i$ )-dependent cheese ingestion rate [kg d<sup>-1</sup>] (Section 8); and  
 $D$  = the time period corresponding to year  $j$  [365d].

The intake from the 1954 accident for the cheese pathway is estimated using the following equation:

$$INT_{cc,i} = C_{mm,T} \cdot F_{cc} \cdot e^{-1_R T_{cc}} \cdot U_{ccA,i} \quad (2-A.15)$$

where

- $C_{mm,T}$  = the time-integrated concentration of <sup>131</sup>I in milk at the time of milking [Bq·d L<sup>-1</sup><sub>milk</sub>]; and  
 $U_{ccA,i}$  = age ( $i$ )-dependent cheese ingestion rate [kg d<sup>-1</sup>] for the time of the accident (Section 8).

Further discussions of individual parameters in Equations 2-A.14 and 2-A.15 are presented in the relevant sections of the main text of this report.

## 2-A.6 Inhalation of Contaminated Air

Atmospheric releases of <sup>131</sup>I produce an increased concentration of <sup>131</sup>I in air at ground level. Individual members of the public may be exposed from inhalation of contaminated air in addition to the ingestion of contaminated food. The inhalation pathway is described in detail in Section 8 of this report. The equations for this pathway are reproduced here. For the routine releases, the following equation applies:

$$INT_{inh,i} = \left( \sum_{k=1}^3 (f_o + (1 - f_o) \cdot r_{io}) \cdot C_{aa,i,k} \cdot BR_i \cdot D_k \right) \cdot \Delta t \quad (2-A.16)$$

where

- $INT_{inh,i}$  = intake of <sup>131</sup>I due to inhalation of contaminated air for an individual of age  $i$  [Bq];  
 $f_o$  = fraction of time spent outdoors [unitless];  
 $r_{io}$  = ratio of the indoor to outdoor concentrations of iodine in air [unitless];  
 $C_{aa,j,k}$  = annual average concentration of physico-chemical form  $k$  in outside air [Bq m<sup>-3</sup><sub>air</sub>];  
 $BR_i$  = breathing rate for an individual at age  $i$  [m<sup>3</sup><sub>air</sub> d<sup>-1</sup>];

- $D_k$  = fraction of the total amount inhaled that deposits and is absorbed in different parts of the respiratory system (applies to each physico-chemical form  $k$ ); and
- $D$  = the time period corresponding to year  $j$  [365d].

For the 1954 accident, the corresponding equation is as follows:

$$INT_{inh,i} = \left( \sum_{k=1}^3 (f_o + (1 - f_o) \cdot r_{io}) \cdot C_{aa,T,k} \cdot BR_{iA} \cdot D_k \right) \quad (2-A.17)$$

where

- $C_{aa,T,k}$  = time-integrated concentration of iodine in chemical form  $k$  in the outside air [ $\text{Bq} \cdot \text{d} \cdot \text{m}^{-3}_{\text{air}}$ ]; and
- $BR_{iA}$  = breathing rate for an individual at age  $i$  during the accident [ $\text{m}^3_{\text{air}} \cdot \text{d}^{-1}$ ].

The time-integrated concentration of  $^{131}\text{I}$  in chemical form  $k$  is estimated from

$$C_{a,T,k} = \int_0^T C_{a,k}(t) dt \quad (2-A.18)$$

Further discussions of individual parameters in Equations 2-A.16 through 2-A.18 are presented in the relevant sections of the main text of this report.

## 2-A.7 Exposure to Multiple Sources of Iodine

Individuals living near the X-10 facility may have been exposed by more than one pathway. In this case, the total intake of  $^{131}\text{I}$  is obtained by simply summing the intakes for individual pathways, as shown below. The summation is performed similarly for the case of routine releases or the 1954 accident.

$$INT_i = (INT_{milk,i} + INT_{beef,i} + INT_{leafy,i} + INT_{inh,i} + \dots) \quad (2-A.19)$$

where

- $INT_i$  = total intake of  $^{131}\text{I}$  at age  $i$ ;
- $INT_{milk,i}$  = intake of  $^{131}\text{I}$  due to ingestion of contaminated milk, at age  $i$  [Bq];
- $INT_{beef,i}$  = intake of  $^{131}\text{I}$  due to ingestion of contaminated beef, at age  $i$  [Bq];
- $INT_{leafy,i}$  = intake of  $^{131}\text{I}$  due to ingestion of contaminated leafy vegetables, at age  $i$  [Bq]; and
- $INT_{inh,i}$  = intake of  $^{131}\text{I}$  due to inhalation of contaminated air, at age  $i$  [Bq].

Three special exposure scenarios are designed to match the most likely dietary habits and lifestyles in the vicinity of the Oak Ridge Reservation. The first exposure scenario refers to individuals living in a "rural farm" setting (i.e., they own land and livestock and produce their own "backyard" cow milk, cheese, vegetables, and eggs). The intake for this exposure scenario is obtained by adding the intakes from inhalation and from the ingestion of backyard cow milk,

beef, leafy vegetables, eggs, and cheese. The doses and risks for this exposure scenario are reported under the label "*diet 1*."

The second exposure scenario refers to individuals in a rural area who do not own their own dairy cows. However, they have some land and can produce their own vegetables and eggs, and they purchase the necessary milk and cheese from farms located nearby. The intake for this exposure scenario is obtained by adding the intakes from inhalation and from ingestion of locally produced commercial milk, beef, leafy vegetables, eggs, and cheese. The doses and risks for this exposure scenario are reported under the label "*diet 2*."

The third scenario refers to individuals in a more "urban" setting, who do not produce their own food products. They buy milk and food products from the grocery store. The intake for this exposure scenario is obtained by adding the intakes from inhalation and from ingestion of regionally averaged commercial milk. The contribution to the total thyroid dose and risk of cancer from other regionally mixed food products is assumed to be negligible compared to the contribution from ingestion of milk. The doses and risks for this exposure scenario are reported under the label "*diet 3*."

Given that the doses and risks from ingestion of goat's milk are substantially larger than the doses and risks from any other exposure pathway, these doses and risks are reported separately under the label "*diet 4*".

#### **2-A.8 Ingestion of Contaminated Mother's Milk by Breast-fed Infants**

If a lactating mother consumes food contaminated with <sup>131</sup>I, a substantial fraction of the ingested iodine will be secreted to milk and supplied to her breast-fed infant. Infants also have a higher uptake of iodine by the thyroid than do people in other age groups. Fortunately, the amount of iodine ingested by an adult female (with respect to that consumed by grazing dairy animals) is such that the concentration in mother's milk is very low compared to the concentration in cow's or goat's milk. Previous studies (NCI, 1997) have shown that the contribution of the ingestion of contaminated mother's milk to the overall dose for a child exposed to contaminated cow's milk after birth is not of dominant importance.

Typically, lactating mothers are considered to be on "*diet 1*," composed of backyard cow milk, all other non-milk food products and inhalation. For locations where backyard cows are not present (e.g., the city of Oak Ridge), lactating mothers are considered to be on "*diet 3*," composed only of regionally mixed milk and inhalation.

#### **2-A.9 Exposure of a fetus**

If a pregnant woman consumes food contaminated with <sup>131</sup>I, a fraction of the ingested iodine penetrates the placenta and is transferred to her fetus. Once the fetal thyroid is developed and starts functioning, it accumulates iodine based on the same physiological principles that apply to children and adults.

Typically, pregnant women are considered to be on "*diet 1*," composed of backyard cow milk, all other non-milk food products and inhalation. For locations where backyard cows are not present (e.g., the city of Oak Ridge), pregnant women are considered to be on "*diet 3*," composed only of

regionally mixed milk and inhalation. Given that the duration of the pregnancy is nine months, the intake of iodine by a pregnant woman was adjusted to (9/12) of the annual intake of a non-pregnant woman. The dose factor for the fetus ( $DCF_{fetus}$ ) represents the dose to the fetal thyroid for a unit intake of  $^{131}\text{I}$  by the pregnant woman, as opposed to a fetal thyroid dose for a unit activity transferred through the placenta (Section 9).

### **2-A.10 References**

NCI, (National Cancer Institute). Estimated Exposure and Thyroid Doses Received by the American People from Iodine-131 Fallout Following Nevada Atmospheric Nuclear Bomb Tests. U.S. Department of Health and Human Services. National Institute of Health. National Cancer Institute, October, 1997.

**APPENDIX 3A**

**SAMPLE "PUSH DATA" FOR CLINTON PILE SLUGS**

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Document consists of \_\_\_\_\_  
 pages and \_\_\_\_\_ figures.  
 No. 3 of 10 copies, Series 11

1. W. A. Rodger
2. M. C. Laverett
3. R. B. Briggs
4. M. H. Tyson
5. Reading File
6. Central File

CLASSIFICATION CANCELLED

January 5, 1946 DATE 1-11-67

To: W. A. Rodger

For The Atomic Energy Commission

From: M. H. Tyson

In Re: SLUGS FOR 706-D

Chief, Declassification Branch *ant*

The following is the information you requested on slugs discharged from the pile on December 31, 1945, January 2, 3 and 5, 1946 for use in the 706-D Buildings:

Row No.	Date Charged	Date Discharged	Days Exposed	Percent Max. nv	ACCUMULATED KWH		Total EWH	No. Slugs
					Period Before Last 40 Days	Last 40 Days		
1769	7-19-45	1-2-46	167	99.5	10,727,416	3,295,379	14,022,795	6
1769	8-11-45	1-2-46	114	99.5	8,764,553	3,295,379	12,059,932	30
1170	3-28-45	1-2-46	280	92.3	19,480,534	3,295,379	22,775,913	12
1170	8-6-45	1-2-46	119	92.3	9,190,807	3,295,379	12,486,186	21
2267	10-5-44	1-2-46	154	92.3	31,475,220	3,295,379	34,770,599	12
2267	8-8-45	1-2-46	117	92.3	9,017,073	3,295,379	12,312,452	24
1572	8-14-45	1-2-46	111	91.2	8,422,130	3,295,379	11,717,509	40
1973	8-14-45	1-2-46	111	91.2	8,422,130	3,295,379	11,717,509	40
1864	9-8-45	1-2-46	116	91.2	6,433,234	3,295,379	9,728,613	40
1764	9-10-45	1-2-46	114	91.2	6,294,667	3,295,379	9,590,046	40
1964	10-7-44	1-2-46	452	91.2	31,312,713	3,295,379	34,608,092	8
1964	3-17-45	1-2-46	291	91.2	20,202,488	3,295,379	23,497,867	32
1664	1-12-45	1-3-46	356	90.1	24,325,210	3,294,153	27,619,363	35
1664	7-19-45	1-3-46	168	90.1	10,808,131	3,294,153	14,102,284	5
2064	9-8-45	1-3-46	117	90.1	6,513,919	3,294,153	9,808,102	40
1466	9-8-45	1-3-46	117	90.6	6,513,919	3,294,153	9,808,102	40
2368	3-18-45	1-3-46	291	90.1	20,227,822	3,294,153	23,521,975	8
2368	5-8-45	1-3-46	240	90.1	16,302,093	3,294,153	19,596,246	32
2370	8-11-45	1-3-46	112	88.4	8,502,815	3,294,153	11,796,998	40
1171	8-11-45	1-3-46	112	90.6	8,502,815	3,294,153	11,796,998	40
2271	8-11-45	1-3-46	112	90.6	8,502,815	3,294,153	11,796,998	40
2073	8-11-45	1-3-46	112	90.1	8,502,815	3,294,153	11,796,998	40
1869	11-23-45	1-5-46	43	100.0	252,691	3,357,562	3,610,253	36
1969	11-23-45	1-5-46	43	99.5	252,691	3,357,562	3,610,253	36
1968	11-23-45	1-5-46	43	99.5	252,691	3,357,562	3,610,253	36
1768	11-23-45	1-5-46	43	99.5	252,691	3,357,562	3,610,253	36
1870	11-23-45	1-5-46	43	99.1	252,691	3,357,562	3,610,253	36
1871	11-24-45	1-5-46	42	97.3	131,296	3,357,562	3,488,858	36
2165	10-31-44	1-5-46	431	79.6	29,745,180	3,357,562	33,102,742	40
2171	11-3-44	12-31-45	423	82.4	29,212,816	3,281,450	32,494,266	42

The per cent of maximum nv takes into consideration only the radial distribution of the canals discharged.

This document contains information...  
 classified as...  
 under...  
 of the...  
 number...

*M. H. Tyson*  
 M. H. Tyson  
 100 Area Superintendent



**APPENDIX 3B**

**SAMPLE HANFORD SLUG IRRADIATION CORRESPONDENCE**

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UNITED STATES ATOMIC ENERGY COMMISSION

In Reply Refer To:  
RMRP:JS

Classification Cancelled

Or Changed To \_\_\_\_\_ Oak Ridge, Tennessee  
By Authority Of \_\_\_\_\_ November 29, 1948  
By gmd Date AUG 20 1971

Carbide and Carbon Chemicals Corporation  
Post Office Box "B"  
Oak Ridge, Tennessee

Attention: C. H. Rucker, Jr., Executive Director  
Oak Ridge National Laboratory

Gentlemen:

The following is an extract of a teletype message received from the Office of Hanford Directed Operations in reply to our request for information, concerning the slugs used in the Rala run which began November 17th.

"Slugs were charged August 17, 1948; discharged November 12, 1948. Tube used for exposure was 2379 of B pile. Effective days of exposure during this period was equal to 76.3 or effective downtime equivalent to about ten (10) days. However, this downtime was not for short periods for purpose of discharging, but actually involved a prolonged shutdown starting September 22 at 07:30 hours and continuing until September 24, midnight, when pile started to operate at about 1/4 nominal power level. During period of September 25 to October 6 the power level was raised incrementally to nominal level. Therefore, during this period the flux varied appreciably from value at nominal power level. The pile was operating at low levels at approximately the half way point of exposure period during which the concentration level of product probably dropped considerably so that the remaining exposure at nominal levels was insufficient to raise the concentration to the desired level. Total weight of uranium was 149.34 pounds."

Sincerely yours,

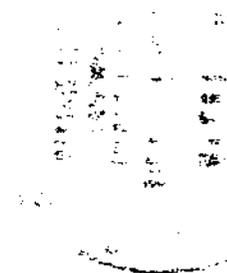
Albert H. Holland, Jr., M.D.  
Director of Research and Medicine

CC: U. S. Center  
R. H. Cook

Shilling

*Ed Davis 1/30/95*  
High review of CCFP...  
...by O...  
...August 1948

SEARCHED  
SERIALIZED 24



~~SECRET~~

2  
a  
1  
10

UNITED STATES  
ATOMIC ENERGY COMMISSION

In Reply Refer To:  
RMR:JS

Classification changed to  
**UNCLASSIFIED**

(Insert appropriate classification level and category)

by authority of T. F. DAVIS 10-18-93  
(Authority for change in classification) (Date)

by C. C. Peters 3/29/94  
(Signature of Person making change) (Date)

verified by: V. S. Norman 3/29/94  
(Signature of person verifying change) (Date)

Carbide and Carbon Chemicals Corporation  
Post Office Box "P"  
Oak Ridge, Tennessee

Oak Ridge, Tennessee  
February 16, 1949

Classification Cancelled

~~By Authority of~~

By EEB

Date DEC 30 19

Attention: C. N. Rucker, Jr., Executive Director  
Oak Ridge National Laboratory

Subject: HANFORD SLUGS FOR RALA RUN NO. 30

Gentlemen:

Thirty-eight four inch Hanford slugs were delivered to you  
February 14 for use in the production of Rala Run No. 30.

Shipment was made from Hanford about 10:00 P.M. (PST), February 9.  
The slugs were obtained from as near as possible the center of  
process tube 2271 F and had 66 days effective exposure in the  
pile at a power factor of 1.473.

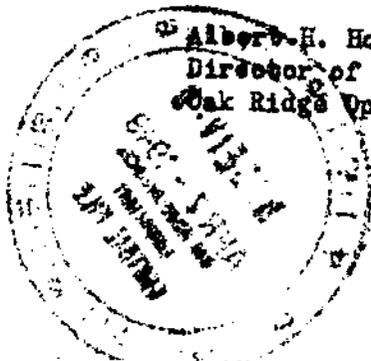
Zero power was 8:49 P.M. (PST), January 27. Next start-up was  
11:35 A.M. (PST), January 28 after which pile operated at 125  
megawatts until 8:00 P.M. (PST), January 29 when full power  
operation was resumed. Zero power before slug discharge was  
2:20 A.M. (PST), February 8.

Sincerely yours,

Albert H. Holland, Jr., M.D.  
Director of Research and Medicine  
Oak Ridge Operations

CC: C. E. Center  
R. W. Cook

Shillings:aw



**APPENDIX 3C**

**SAMPLE PAGES FROM 100 AREA (CLINTON PILE) LOG BOOKS**

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Dr Roberts wants to make another run at the thermal column tonight  
 Open shutters at 12<sup>00</sup> AM. Dr. Roberts will arrange to have them closed in the morning.

3-2  
12  
12  
Fu

Nothing going on in oven room before Vt. Andrew.

3-25-47 1. Alternates since Core entered Room 106

1258 Hole 19, & Bldg 205 & 101 on.

4/12 ~~2.~~ Constant power all shift for research 2nd & Weger 3 level.

3. Wollan operated at hole 22 - 4<sup>30</sup> pm 12 pm -

4. Picked up all slugs on floor of deep pit.

5. Shipped 10 full carriers 26 slugs each 1 carrier

~~with 13 slugs, to 706 D. Total shipped 273 from bucket 18. 3 rejects now in B. 4/5.~~

24 slugs short of total pushed.

6. Picked up slug bins and swept elevator.

7. Changed Bedell's samples in decay curve

303-114 - 303-115 + 303-116.

8. Cut canal water + mattress spray water off 11<sup>45</sup> pm Tower house checked water in bad condition.

9. Flood light switch for 115 bad.

Discharged and charged the following rows of slugs:—

Discharged into Bucket #18.

1567 36 slug row

1568 36 " "

1569 36 " "

1664 40 " " {inserted thermocouple at 2.3 West

1666 36 " "

1670 36 " "

1671 36 " "

1771 36 " "

1869 36 " "

1872 36 " "

TOTAL 364

14. (Lost time 3.7 hr.) total lost time 1.084 hrs.

15. Instrument Department worked on Internal Temp # 2 and changed some of the thermocouples around. Check the new list which has been posted.

138

GALV. POWER

HEAT POWER

DATE	DAY #	SHIFT	GALV. POWER			HEAT POWER			DATE		
			SHIFT	TOTAL TO DATE		SHIFT	TOTAL TO DATE				
3-4-47	1217	12-8	30,521	80	322	366	30,674	81	070	447	3-12
		8-4	1,900	80	324	266	6,295	81	076	742	3-12
		4-12	28,072	80	352	338	22,923	81	099	665	
3-5-47	1218	12-8	31,660	80	383	998	31,738	81	131	403	
		8-4	29,609	80	413	607	27,231	81	158	634	3-12
		4-12	30,300	80	443	907	28,870	81	187	504	
3-6-47	1219	12-8	30,400	80	474	307	29,533	81	217	037	
		8-4	30,200	80	504	507	29,205	81	246	242	3-15
		4-12	30,340	80	534	847	30,247	81	276	489	
3-7-47	1220	12-8	27,540	80	562	387	27,966	81	304	455	
		8-4	25,220	80	587	607	26,891	81	331	346	3-16
		4-12	30,400	80	618	007	29,712	81	361	058	
3-8-47	1221	12-8	30,499	80	648	506	30,202	81	391	260	
		8-4	30,375	80	678	881	29,379	81	420	639	3-16
		4-12	29,900	80	708	781	30,342	81	450	981	
3-9-47	1222	12-8	30,918	80	739	699	31,350	81	482	381	
		8-4	30,410	80	770	109	29,113	81	511	444	3-16
		4-12	30,215	80	800	324	29,962	81	541	406	
3-10-47	1223	12-8	28,229	80	824	553	29,520	81	570	926	
		8-4	24,394	80	852	947	22,625	81	593	551	3-16
		4-12	30,030	80	882	977	30,281	81	623	832	
3-11-47	1224	12-8	26,056	80	909	033	27,525	81	651	357	
		8-4	14,755	80	923	788	14,957	81	666	308	3-16
		4-12	30,460	80	954	248	29,510	81	695	818	
3-12-47	1225	12-8	30,240	80	984	488	31,248	81	727	066	
		8-4	29,928	80	014	416	27,208	81	754	274	3-16

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**APPENDIX 3D**

**SAMPLE PAGES FROM A CHEMICAL SEPARATIONS  
OPERATIONS LOG BOOK**

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- 4- Shut Off the Air Jet WC-6 to WC-5
- 5- W-6 to W-8 Jet is still ON. W-8 LL at 11:00 PM, 8'11"
- 6. Finished boiling the 4<sup>th</sup> extracts P<sup>3</sup> down in EV #1.

10-22-54 1. W6 TO W8 Jet is still going.

12-8 2. WASHED COTRELL DOWN.

BUEVINS. 3. DISSOLVED 5 GMS OF BaNO<sub>3</sub> IN 200 ML OF H<sub>2</sub>O AND ADDED TO #200 CUB P.E. TANK THEN ADDED 5800 ML OF 70% HNO<sub>3</sub> TO P.E. + 7 LITERS OF FUMING HNO<sub>3</sub> THEN FILTERED TO MW. AVE. 309 ml/min. BEFORE THE BaNO<sub>3</sub> TEST WE RAN TWO RATE TESTS WITH WATER AND GOT 420 ml/min EACH TEST.

THE PE TO MW FILTER HAS BEEN BACK WASHED AND PE WASHED OUT G.H.G. HEAD TO OFF GAS. MW HAS ACID FILTRATION WASTE.

10-22-54 1. M.H. <sup>149</sup> ~~149~~ back in service.

8-4 2. BROUGHT big truck back FROM GARAGE, however they requested it be sent back by next Wednesday 10-27-54.

- H.B. 3. MADE UP 1<sup>ST</sup> PART OF COATING REMOVAL IN A1.
- 4. SAMPLED MW FN AND EMPTIED M.W.
- 5. RAN 1 AMMONIA BIFLUORIDE Rinse THROUGH P.E. Filter then rinsed with H<sub>2</sub>O several times.
- 6. SAMPLED WC5 AND TURNED INTO LAB.

7. Brought down 1 slug for I 131.
8. Removed cone from Ch. Head cleaned and replaced back in carrier.
9. Loaded 16 slugs to A1. Carrier is at pile bldg. over shift change.
10. Gased up big truck.

10-2

12-

BLE1

- 10/22/54 - 1. Finished loading the remainder of the 4-12 86 slugs to A-1. Cleaned and stored R.L.N. slug knocker and chngen.
2. Two more patrol jobs came in on this shift. See instructions log book.
  3. Had to shut steam header down at tanks M 14, 17, 18 and cool M-18 jet with water before it would jet.
  4. The filter at M-4 float manhole is sealed in with Lux seal. Seems to be tight.
  5. Sampled M.H. 22 = 39 g/m/m / 3500 = 765 and O.D.B. = 160.
  6. Ran two filter rate test on P.E. 200 filter. Put cone under C.H. and started backwashing with  $\text{HNO}_3$  & water.
  7. Rd L2 status.
    - A-1 second coating removal starts cooling at 12:20 A.M.
    - M-10 9% caustic.
    - T-8 20%  $\text{HNO}_3$
    - T-9 20%  $\text{HNO}_3$
  8. G.E. Phillips will replace D2015 on the 8-9 shift Saturday.

10-

8-

Sun

9- M-6 to M-8 jet is still on M-8 LL. 11' 2".

10-23-54 1. CUT W6 TO W8 JET OFF AT 3:00AM & STEAMED THE LINE. W6 LL. - 6' 5 1/2" W8 LL. - 11' 6" BLEVING. 2. WITH THE #200 CUB. P.F. TO M.W. FILTER BACKWASHED TWO 19 LITER H<sub>2</sub>O FILTER TESTS WERE MADE OF WHICH 818 ML/MIN RATE WAS OBTAINED ON EACH.

3. RALA STATUS:  
A1 - SLUGS + 1190# H<sub>2</sub>O BEING ADDED AT 5. CHANGE.  
T8 - 440# H<sub>2</sub>O FOR STEP 39 ON BONDING REMOVAL.  
T9 - 390# HNO<sub>3</sub> FOR BATCH A DISSOLVING.  
1C SAMPLE SHOWED .123 SLUG.

10-23-54 ① Jetted ~ 500 gals. of H<sub>2</sub>O from W16,17,18 jet pit to S.B. Lab. analysis showed 6700 c/s/min.

② Left cover off W16 jet pit & jetted solution to ~6" below jets. Had maint. set up emergency whirly in case pit will not jet or solution gets too hot to go to S.B. If too hot (c/s/min) pump into W12 drain at Bagle.

③ Continued T.F. & Patrol.

④ Run status: A1 - Batch A Diss.  
A8 - H<sub>2</sub>O  
R.C.-200 - Running 300 HNO<sub>3</sub> thru Resin.

⑤ High air count at 3:30PM. shut down dissolving.

## 10-24-54 1. Res L2 Status

4-1 - A-1 BATCH B DISSOLVING.

R.N. A-9 BATCH A DIGESTING UNTIL 12:00 M.N.

A-8 WATER.

A-5  $\text{Na}_2\text{CO}_3$  TO NEUTRALIZE BATCH A.

M-1 MT

INA RESULTS 12,176 C'S.

2. THE SP.GR. ON A-1 ONLY SHOWS 1.27 ON THE NITRIC FOR DISSOLVING THAT IS 1.36 BUT THE VOLUMES CHECKED CLOSE AFTER THE DILUTION WATER WAS ADDED.

3. H-1 FLOAT WAS HUNG UP AND AT 11:00 WE FOUND H-1 FULL

4. CONTINUED WITH TANK FARM AND RESIN

E - THE AIR COUNT AT 5:00 PM WAS 500

AND 12 KM HOLT LIFE STAFF FOR H.F.

6. FINISHED RESIN EXTRACTION AND SAMPLED. DID NOT START THE REGENERATION.

3 M AND SAMPLE FROM ISO TANK WAS 1.21 M

10-24-54 1. C.T. CARNEY THE INST. MAN CHECKED A1 SP.GR.

12-8

BLEVINS.

FOR ERROR BY USING THE SMALL MANOMETER AND FOUND THE CHART TO READ HIGH <sup>WEIGHT</sup> SO HE PUT A WEIGHT ON THE LOW SIDE OF SP.GR. INST.

2. DID A REGENERATION CYCLE ON THE RESIN IN #200 CUB.

3. RALA STATUS:

A1 - BATCH B COOLING & SAMPLES CIRCULATING IT HAS BEEN DILUTED.

A5, A9, A8, A11, A17, T4 - MT

10/2

4  
R.

**APPENDIX 3E**

**A SAMPLE X-10 RALA RUN REPORT**

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This document consists of 10 pages and 1 figure. No. 3 of 6 copies. Series A

1. W. A. Rodger
2. M. C. Leverett
3. M. D. Peterson
4. A. C. Vallado
5. Central File
6. Reading File

Classification Cancelled

W. A. Rodger

4-10-46

A. C. Vallado

By [Signature] Date [Signature]

706-D Production Run #9  
(Shipment #17)

Mechanical Changes

Immediately upon the completion of Run #8, the decontamination of Cell A was begun, and maintenance work started when the tolerance levels reached 50 to 100 mr/hr. Sampling blisters, Cell IV and the floor around the cubicles were decontaminated also. For a complete account of maintenance work done in the building between Runs #8 and #9, see the report written by E. J. Witkowski on 706-D Building and equipment repairs, alterations and checking during period 1-13-46 to 3-3-46.

Dissolver Operations

The 894 slugs charged to the dissolver for Run #9 were added as follows:

<u>Date Pushed and Charged</u>	<u>Slugs Loaded</u>	CLASSIFICATION CANCELLED
3-3	517	<u>Jed Davis</u> 11/29/94
3-5	507	ADD signature Date
3-6	270	Single rereview of CCRP-declassified documents was authorized by DOE Office of
	894	Declassification memo of August 22, 1994

The slugs loaded on 3-3, 3-5 and 63 of the ones loaded on 3-6 were used for Run #9. The remainder of the slugs loaded on 3-6 were used for the Health Physics run which followed Run #9. For the purpose of calculation all 894 slugs are considered. These were calculated to have an average of 7.8 Curies/slug active, and 0.65 mg/slug inactive Ba (Total: 8950 Curies and 565 mg) at time of discharge.

The run was made in a single series, consisting of eleven dissolvings and extractions followed by metathesis, cake solution, electrolysis and volume reduction in B6. The Health Physics run (referred to as second series) which followed run #9 consisted of four dissolvings and extractions followed by metathesis, cake solution, electrolysis and volume reduction in B1. This second series was primarily intended to act as a stand-by in case some unusual losses occurred during the main run. As this was not the case, it was delivered to Health Physics.

~~This document contains information affecting the national defense of the United States within the meaning of the Espionage Act, 18 U.S.C. 793 and 794. Its transmission or the revelation of its contents in any manner to an unauthorized person is prohibited by law.~~

The amounts of reagents used for the coating removals were 136# 60% HNO<sub>3</sub>, 682# of 20% NaOH. The 20% NaOH was used instead of the usual 35%, because the solution was stored in the outside tank M-11, where it could easily freeze. For the metal solutions, the reagents were decreased about 25% of previous runs (590# of 60% HNO<sub>3</sub> and 170# H<sub>2</sub>O) in order to dissolve 65 slugs/batch instead of 85, thereby preventing extractor tank A9 from overflowing.

A total of fifteen (average 61.2 slugs dissolved) metal solutions and three coating removal reactions were carried out. Some difficulty was encountered in maintaining an operating vacuum in the dissolver during the coating removal reactions. It was discovered that the off-gas system to A-1 was sealed off by a combination of the higher solution level in the dissolver and the violent reaction. This will be rectified in the next run, by increasing the concentration of NaOH solution. All metal solutions were carried out without difficulty.

### Extraction

The amounts of reagents for all fifteen extractions were decreased approximately 23% of previous flowsheet quantities for the smaller batch size (210# of 90% H<sub>2</sub>SO<sub>4</sub>, 670 cc of 20% Pb(NO<sub>3</sub>)<sub>2</sub> for A batches and 120 cc of 20% Pb(NO<sub>3</sub>)<sub>2</sub> for all others. The fifteen decantations were cut at 2.4" to 15.5" heels on the oil liquid level manometer using jet A9-ABDA with the exception of those prior to metathesis on which jet A9-ABDB was used. Larger heels were left in extractor A9, because the A9-ABDA suction line was set six inches off the bottom. Although extractor A9 did not overflow throughout the run, and larger heels were left behind, the extraction losses were more than during previous runs. The losses averaged 35 Curies per extraction or 11.2% of the product from each individual dissolving. A possible explanation for these increased losses could be the partial plugging of A9-ABDA jet as shown by the wide range of decanting time (16 to 65 minutes). See Table II for complete extraction decantation results.

The extraction cakes from each of the two series given the standard one acid, four water washes, all of 4 gallons volume. Each wash was agitated 5 minutes, settled 70 minutes and decanted to 2.1" to 3.6" heel on the oil liquid level manometer using jet A9-ABDB. The waste loss for the combined washes was 5.5 Curies. (See Table I)

### Metathesis

Both metathesis were normal and uniform reagent quantities were used. They were decanted to AB using jet A9-ABDB and cutting at 2.2" to 4.5" heels on the oil liquid level manometer. The combined waste loss of the metathesis and metathesis cake wash of the first series was rather high (296 Curies). This loss was added to the first extraction batch of the second series. See Table III for metathesis conditions and losses.

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Some difficulty was experienced in transferring the cake solution of the first series to the crud filter due to the plugging of the A9 to B26 jet. The solution was therefore transferred to B12, then sucked up by B7, discharged to B26, filtered through the crud filter to B27 and transferred to B12 in three shots. The cake solution of the second series was transferred directly to B12 without going through the crud filter, as the disc was partially plugged by material removed from the first series. Final volumes in the electrolysis vessel were 4000 and 4500 cc respectively.

#### Cell B Operation

The electrolysis time for the first series was increased one hour (3 hours at 15 amps. and 7 hours at 25 amps.) to insure a low Pb value. The second series was standard. No Barium carrier was added in either series.

Operation of the glassware was reasonably smooth. After electrolysis the product of the first series was transferred to precipitator B6, evaporated to dryness, dissolved in 2 liters of water and reconcentrated to a 500 cc volume. The solution was transferred to B21R by way of B11 without difficulty, where two fuming nitric precipitations were made followed by two barium chloride precipitations and subsequent washings. The combined losses were quite high (373 Curies or 10.5% of total product dissolved.) The disc in the reactor was more porous than any previous one. This allowed filtering rates 3-4 times faster than those previously experienced, but for some reason (probably due to fact that the drip tip was broken off) liquid held up in the disc to a great extent. Consequently when pressure was put under a dry disc, liquid would appear on top of the disc. This made it impossible to clean the transfer vessel as well as is desirable and probably accounted for the high iron contents in the product.

The product solution was transferred from B17 to B19 via the upper discharge funnel. B21 transfer vessel was rinsed to B17 with 40 cc of water and then transferred to B19 over the same route. The final evaporation took 4 hours and proceeded without difficulty.

Final analysis of run #9 product was:

<u>Active Barium</u>	2040 Curies at 0400 - 3-11-46 (LST)
Pb	23 mg
Fe	38 mg
Cr	4 mg
Ni	8 mg
Sr	1 mg
Ba	800 mg

The product was somewhat darker than usual, but had the usual distribution in the cone.

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After electrolysis of the second series, the product was transferred to B1 with pipette B6, evaporated to dryness, dissolved in 2000 cc of water and reconcentrated to 350 cc. The bulk of the product was transferred to B19 via movable funnel B2 and evaporated to dryness. B1 was rinsed with 200 cc of water and transferred to B19 via the same route. The combined final evaporation time was 10½ hours.

The EC1-ether waste solution was evaporated in a Pt-lined cone and delivered to 706-C. This will hereafter be delivered as a liquid or not at all. The procedure was time consuming, difficult, and dangerous to equipment.

The overall Run #9 was the most successful to date; a full 2000 Curies were produced with a 57% yield; counting the Health Physics run essentially all the product was accounted for and from beginning to end it was never over 3 hours off schedule.

#### Analyses

In Table I complete analytical data are presented. Table IA gives a summation of Barium losses for the run. Table IB gives direct radiation measurements which were taken on the open cone from the top of the chimney. The G.E. chamber indicated 2000 Curies were present for shipping.

#### Contamination and Radiation Exposure

The building and off-gas systems remained cool throughout the run and there were no over-exposures. Only one incident (described in 206 Area Report for week ending March 9) marred the entire run.

During the early part of the run some increase in air counts occurred on the third level when jetting solution from A9-A8; this despite very careful venting procedures. The counts were generally below tolerance, however.

The first two days of the run, Iodine was collected from the trap between A3 and A4. As the metal which was being dissolved was quite young a large amount of material was available. The system was not properly trapped, however, and hot gases got into the vacuum system causing an increase in air counts. The experiment was discontinued until a more adequate set-up could be devised. Air counts returned to normal at once.

No working area in the building was over tolerance except that between B3 and B6 blisters. This area was just over. The cell off-gas system remained below 200 mr/hour throughout the run. Most working areas were below 25 mr/day.

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TABLE I

(All Curies are Calculated to 0400 - 3/11/46)

Fraction		Code	Curies Product	Curies in Waste	% Total Product Dissolved
<u>First Series</u>					
First First	Dissolving Extraction	1MA 8WMA	298	18	0.5
Second Second	Dissolving Extraction	1MB 8WMB	353	9	0.2
Third Third	Dissolving Extraction	1MC 8WMC	360	6	0.2
Fourth Fourth	Dissolving Extraction	1MD 8WMD	345	41	1.2
Fifth Fifth	Dissolving Extraction	1ME 8WME	341	14	0.4
Sixth Sixth	Dissolving Extraction	1MF 8WMF	310	27	0.8
Seventh Seventh	Dissolving Extraction	1MG 8WMG	280	62	1.7
Eighth Eighth	Dissolving Extraction	1MH 8WHM	288	65	1.8
Ninth Ninth	Dissolving Extraction	1MI 8WMI	360	63	1.8
Tenth Tenth	Dissolving Extraction	1MJ 8WMJ	305	39	1.1
Eleventh Eleventh	Dissolving Extraction	1MK 8WMK	316	31	0.9
Total Dissolved			3556		
Total Extraction Waste				375	10.6
<u>Second Series</u>					
First First	Dissolving Extraction	1ML 8WML	303	57	5.2

TABLE I  
(Continued)

(All Curies are Calculated to 0400 - 3/11/46)

Fraction	Code	Curies Product	Curies in Waste	% Total Product Dissolved
Second Dissolving Second Extraction	11A; 8WMA	276	37	3.4
Third Dissolving Third Extraction	11K 8WMT	277	23	2.1
Fourth Dissolving Fourth Extraction	11O 8WMO	241	30	2.7
Total Dissolved Total Extraction Waste		1097	147	100 13.4
<u>First Series</u>				
Extraction Cake Wash	8WF		5	0.1
Metathesis and Metathesis Cake Wash	8WC ) 8WCF )	296		8.3
Total Cell A Loss			878	19.0
Electrolysis Loss	8WFB		32	0.9
Product in B6	6P	2360		
B-6 Rinse			52	1.4
Fuming Nitric Wastes	8WFI		21	0.6
HCl-ether Wastes			352	9.9
Total Cell B Loss			457	12.8
Final Product	17P	2040		
<u>Second Series</u>				
Extraction Cake Wash	8WF		0.5	0.04
Metathesis and Metathesis Cake Wash	8WC ) 8WCF )	191		17.4

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TABLE I  
(Continued)

(All Curies are Calculated to 0400 - 3/11/46)

Fraction	Code	Curies Product	Curies in Waste	% Total Product Dissolved
Total Cell A Loss			338	30.8
Electrolysis Loss			29	2.6
Product in B1	1P	1275		

TABLE IA

Summation of Barium Losses - Run No. 9  
(Based on LST 0400 - 3/11/46)

Fraction	Curies	%
Total Dissolved (Calculated as 687 Slugs)	5455	100
Decay Loss (8, 6, 5, Days)	1725	31.7
Known Loss in Cell A	676	12.4
Known Loss in Cell B	457	8.4
Product Yield	2040	37.4
Material Balance		89.9
<hr/>		
Total Curies Found in Dissolver Solution Calculated to 0400 - 3/11/46	3556	100
Cell A Waste Losses	676	19.1
Cell B Waste Losses	457	12.8
Product Yield	2040	57.5
Material Balance	3173	89.4

TABLE IA

Summation of Barium Losses - Run No. 9  
Including Product to Health Physics  
(Based on LST - 0400 - 3/11/46)

Fraction	Curies	%
Total Dissolved (Calculated as 894 Slugs)	8950	100
Decay Loss (8, 6, 5, Days)	2083	30.0
Known Loss in Cell A	1014	14.6
Known Loss in Cell B	486	7.0
Product Yield	3318	47.7
Material Balance		99.5
Total Curies Found in Dissolver Solutions Calculated to 0400 - 3/11/46	4653	100
Cell A Waste Losses	1014	21.8
Cell B Waste Losses	486	10.5
Product Yield	3315	71.2
Material Balance	4815	103.5

TABLE IB

Direct Radiation Measurements For Run No. 9

Curies Analyzed	2000	
Instrument	Time in Hours	r/Hour
G.E. Chamber	16	16
	18	17 $\frac{1}{2}$
	26	21 $\frac{1}{2}$
	28	22 $\frac{1}{2}$
100 R Meter (1)	16	19
	26	21
100 R Meter (2)	26	20

TABLE II  
Extraction Decantations

Batch	Rate of Decantation Gal/min	Heel Gals.	Ba Loss	
			Curies	% of Product Present at Decantation
<u>First Series</u>				
9A	2.0	4.75	18	0.6
9B	3.3	3.2	9	1.5
9C	1.3	3.2	6	0.6
9D	4.3	2.56	41	3.1
9E	4.5	3.0	14	0.8
9F	3.7	2.9	27	1.3
9G	3.4	3.2	62	2.7
9H	2.2	2.8	65	2.5
9I	4.3	3.84	63	2.1
9J	5.4	3.0	39	1.2
9K	2.5	0.72	31	0.9
<u>Second Series</u>				
9L	5.3	2.95	57	18.8
9M	3.6	3.57	37	6.4
9N	2.8	1.76	23	2.7
9O	2.9	0.86	30	2.7

TABLE III

Metathesis

Treatment	Settling Time (Hours)	Heal cc	Curies	% of Product Present at Decantation
<u>First Series</u>				
First Metathesis	2½	3480)	----- 94.5	2.7
Second Metathesis	2½	3480)		
First Metathesis Cake Wash	2½	4240)	----- 201.5	5.7
Second Metathesis Cake Wash	2½	1100)		
<u>Second Series</u>				
First Metathesis	2½	6800)	----- 133	12.1
Second Metathesis	2½	3850)		
First Metathesis Cake Wash	2½	4320)	----- 58	5.3
Second Metathesis Cake Wash	2½	2000)		

TABLE IV  
Time Cycles

<u>Operation</u>		<u>Hours Required</u>	
<u>Charging</u>			
9A	317 Slugs		
9D	307 "		
9I	270 "		
<u>Coating Removal</u>			
	First		
	Second		
	Third		
<u>Metal Solution and Extraction</u>		<u>Solution</u>	<u>Extraction</u>
<u>(First Series)</u>			
	9A	2 $\frac{1}{2}$	11 $\frac{1}{2}$
	9B	3 $\frac{1}{2}$	12 $\frac{1}{2}$
	9C	2 $\frac{1}{2}$	10 $\frac{1}{2}$
	9D	2 $\frac{1}{2}$	10 $\frac{1}{2}$
	9E	3	10
	9F	3 $\frac{1}{2}$	10
	9G	3 $\frac{1}{2}$	10
	9H	4	10
	9I	3	10
	9J	2 $\frac{1}{2}$	10 $\frac{1}{2}$
	9K	2 $\frac{1}{2}$	10
<u>(Second Series)</u>			
	9L	3 $\frac{1}{2}$	10
	9M	4	10
	9N	5	10 $\frac{1}{2}$
	9O	7	11
<u>Extraction Cake Wash</u>			
	First Series		7
	Second Series		7
<u>Metathesis</u>			
	First Series		9
	Second Series		8 $\frac{1}{2}$

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TABLE IV  
(Continued)

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Time Cycles

<u>Operation</u>	<u>Hours Required</u>
<u>Metathesis Cake Wash</u>	
First Series	8½
Second Series	8½
<u>Metathesis Cake Solution</u>	
First Series	2½**
Second Series	2½***
<u>Electrolysis</u>	
First Series	10
Second Series	9
<u>PbO<sub>2</sub> Plate Removal</u>	
First Series	4
Second Series	No Data
<u>Volume Reduction in D6</u>	
First Series	3½
<u>Volume Reduction in E1</u>	
Second Series	8½
<u>Fuming Nitric Precipitation in E21</u>	
First Series	2½
<u>BeCl<sub>2</sub> Precipitation, Washing, Product Solution</u>	
First Series	1½
<u>Sampling</u>	
First Series	2
Second Series	2
<u>Final Product Evaporation</u>	
First Series	4
Second Series	10½***

\* Lines were plugged.

\*\* By-passed crud filter.

\*\*\* Two shots.

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TABLE IV  
(Continued)

Time Cycles

<u>Operation</u>	<u>Hours Required</u>
<u>Direct Radiation Measurements</u>	
First Series	10
Second Series	10
<u>Loading</u>	
First Series	4
Second Series	6

A. C. Vallado

**APPENDIX 3F**

**A SAMPLE RALA RUN ANALYTICAL REPORT**

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**APPENDIX 3G**

**RALA DISSOLVING BATCHES CONDUCTED  
IN X-10'S BUILDING 706-D**

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**Appendix 3G: RaLa Dissolving Batches Conducted in X-10's Building 706-D**

Batch Name	Start of Dissolving			No. of Slugs Dissolved			Duration (h)	Direct Release Class
	Date	Year	Shift or Time	X-10	4" Hanf.	8" Hanf.		
1A	28-May	1945	Night Shift, Beginning	58	0	0	6	1
1B	28-May	1945	Day, Beginning	58	0	0	6	1
1C	29-May	1945	Night, Beginning	49	0	0	7	1
1D	29-May	1945	Day, Middle	43	0	0	12	1
2AA	5-Jun	1945	Night, Beginning	52	0	0	7	2
2AB	5-Jun	1945	Swing, Beginning	52	0	0	7	2
2AC	6-Jun	1945	Night, Middle	52	0	0	8	1
2AD	6-Jun	1945	Swing, Middle	52	0	0	5	1
2BA	7-Jun	1945	Night, Middle	52	0	0	6	1
2BB	8-Jun	1945	Swing, Beginning	52	0	0	7	2
2BC	9-Jun	1945	Night, Beginning	52	0	0	9	1
2BD	9-Jun	1945	Swing, Middle	52	0	0	5	1
2CA	10-Jun	1945	Night, Middle	52	0	0	6	1
2CB	11-Jun	1945	Day, Beginning	52	0	0	8	1
2CC	11-Jun	1945	Swing, Beginning	52	0	0	14	1
2CD	12-Jun	1945	Day	52	0	0	4-14 U*	1
3AA	12-Jul	1945	Swing, Beginning	73.3	0	0	6	1
3AB	13-Jul	1945	Night, Middle	73.3	0	0	6	1
3AC	13-Jul	1945	Swing, Beginning	73.3	0	0	7	1
3AD	14-Jul	1945	Night, Beginning	73.3	0	0	10	1
3BA	15-Jul	1945	Night	73.3	0	0	9	1
3BB	15-Jul	1945	Swing	73.3	0	0	5	1
3BC	16-Jul	1945	Day	73.3	0	0	6	2
3BD	16-Jul	1945	Swing	73.3	0	0	9	2
3CA	17-Jul	1945	Swing	73.3	0	0	6	2
3CB	18-Jul	1945	Day	73.3	0	0	6	1
3CC	18-Jul	1945	Swing	73.3	0	0	8	1
3CD	19-Jul	1945	Day	25	0	0	4-14 U	1
4AA	6-Aug	1945	Swing	52	0	0	5	1
4AB	7-Aug	1945	Night	52	0	0	6	1
4AC	7-Aug	1945	Swing	52	0	0	8	1
4AD	8-Aug	1945	Night	52	0	0	12	1
4AE	8-Aug	1945	Day	52	0	0	4	1
4AF	9-Aug	1945	Night	52	0	0	4	1
4BA	9-Aug	1945	Swing	52	0	0	6	1
4BA'	10-Aug	1945	Swing	52	0	0	4-7 U	1
4BB	11-Aug	1945	Swing	52	0	0	3	1
4BC	12-Aug	1945	Night	52	0	0	6	1
4BD	12-Aug	1945	Day	52	0	0	4	1
4BE	13-Aug	1945	Night	52	0	0	4	1
4BF	13-Aug	1945	Day	52	0	0	5	1
4CA	15-Aug	1945	Night	52	0	0	4	1
4CB	15-Aug	1945	Day	52	0	0	4	1
4CC	15-Aug	1945	Swing	52	0	0	4	1
4CD	16-Aug	1945	Day	52	0	0	4	1
4CE	16-Aug	1945	Swing	52	0	0	5	1
4CF	17-Aug	1945	Day	52	0	0	4-7 U	1
4CG	20-Aug	1945	Night	52	0	0	11	1
4CH	20-Aug	1945	Day	52	0	0	12	1
4CI	23-Aug	1945	Day	52	0	0	9-22 U	1

\* Denotes a range between 4 and 14 hours, with each contained whole-number duration equally likely.

**Appendix 3G: RaLa Dissolving Batches Conducted in X-10's Building 706-D**

Batch Name	Start of Dissolving			No. of Slugs Dissolved			Duration (h)	Direct Release Class
	Date	Year	Shift or Time	X-10	4" Hanf.	8" Hanf.		
5BA	4-Sep	1945	Swing	61.5	0	0	6	1
5BB	5-Sep	1945	Night	61.5	0	0	6	1
5BC	5-Sep	1945	Day	61.5	0	0	4-14 U	1
5BD	6-Sep	1945	Day, Beginning	61.5	0	0	5	1
5BE	6-Sep	1945	Day, End	61.5	0	0	5	1
5BF	7-Sep	1945	Night, Beginning	61.5	0	0	7	1
5BG	7-Sep	1945	Day	61.5	0	0	6	1
5BH	8-Sep	1945	Night	61.5	0	0	5	1
5BI	8-Sep	1945	Day	61.5	0	0	4	1
5CA	9-Sep	1945	Night	61.5	0	0	4	1
5CB	10-Sep	1945	Day	61.5	0	0	3	1
5CC	10-Sep	1945	Swing, Beginning	61.5	0	0	4	1
5CD	11-Sep	1945	Night	61.5	0	0	5	1
5CE	11-Sep	1945	Swing, Beginning	61.5	0	0	5	1
5CF	12-Sep	1945	Day	61.5	0	0	7	1
5CG	12-Sep	1945	Swing	61.5	0	0	9	1
5CH heels	13-Sep	1945	Night	61.5	0	0	25-38 U	1
5CI heels	14-Sep	1945	Day	61.5	0	0	41-54 U	1
6A	24-Nov	1945	Day, Beginning	85	0	0	5	3
6B	24-Nov	1945	Day, End	85	0	0	4	1
6C	25-Nov	1945	Night	85	0	0	4-14 U	2
6D	25-Nov	1945	Day	85	0	0	4	1
6E	25-Nov	1945	10:30 PM	85	0	0	4	1
6F	26-Nov	1945	Day	85	0	0	5	1
6G	26-Nov	1945	Swing	85	0	0	5	1
Heels	28-Nov	1945	Swing	9.3	0	0	25-38 U	3
6H	2-Dec	1945	Night	60	0	0	4	2
6I	2-Dec	1945	Day	60	0	0	4	2
6J	2-Dec	1945	Swing	60	0	0	5	2
6K heels	3-Dec	1945	Day	60	0	0	11	1
Heels	3-Dec	1945	Swing	9.3	0	0	17-30 U	1
7A	14-Dec	1945	Swing	66	0	0	3	1
7B	15-Dec	1945	Night	66	0	0	4-14 U	3
7C	15-Dec	1945	Swing	66	0	0	3	3
7D	16-Dec	1945	Night	66	0	0	5	1
7E	16-Dec	1945	Day	66	0	0	4	1
7F	17-Dec	1945	Night, Beginning	66	0	0	6	1
7G	17-Dec	1945	Day	66	0	0	6	1
7H	18-Dec	1945	Swing	66	0	0	5	3
7I	19-Dec	1945	Day	66	0	0	8	1
7J	20-Dec	1945	Night	66	0	0	8	1
7K	21-Dec	1945	Night	66	0	0	10	1
7L	21-Dec	1945	Swing	66	0	0	4-14 U	1
7M	22-Dec	1945	Day	66	0	0	4-14 U	1
7N	23-Dec	1945	Day	66	0	0	4-14 U	1
8A	2-Jan	1946	Swing	79.65	0	0	5	2
8B	3-Jan	1946	Night	79.65	0	0	5	1
8C	3-Jan	1946	Swing	79.65	0	0	3	1
8D	4-Jan	1946	Night	79.65	0	0	4	1
8E	4-Jan	1946	Day	79.65	0	0	4	1
8F	4-Jan	1946	Swing	72	0	0	5	1
8G	5-Jan	1946	Day	79.65	0	0	3	1
8H	5-Jan	1946	Swing	79.65	0	0	3	1
8I	6-Jan	1946	Day	79.65	0	0	5	1
8J	7-Jan	1946	Swing	79.65	0	0	3	1
8K	8-Jan	1946	Night	79.65	0	0	4	2
8L	8-Jan	1946	Day	79.65	0	0	4	2
8M	9-Jan	1946	Night	79.65	0	0	3	1

**Appendix 3G: RaLa Dissolving Batches Conducted in X-10's Building 706-D**

Batch Name	Start of Dissolving			No. of Slugs Dissolved			Duration (h)	Direct Release Class
	Date	Year	Shift or Time	X-10	4" Hanf.	8" Hanf.		
8N	9-Jan	1946	Day	79.65	0	0	4-14 U	1
8O	11-Jan	1946	Day	79.65	0	0	4-7 U	1
8P	13-Jan	1946	Night	79.65	0	0	4-14 U	1
Heels	13-Jan	1946	Day	79.65	0	0	25-38 U	2
9A	4-Mar	1946	Day	61.2	0	0	3	2
9B	4-Mar	1946	Day	61.2	0	0	4	2
9C	4 or 5-Mar	1946	Swing or Night	61.2	0	0	3	2
9D	5-Mar	1946	Swing	61.2	0	0	3	2
9E	5-Mar	1946	Swing	61.2	0	0	3	2
9F	6-Mar	1946	Day	61.2	0	0	3	1
9G	6-Mar	1946	Swing	61.2	0	0	3	1
9H	7-Mar	1946	Night	61.2	0	0	4	1
9I	7-Mar	1946	Swing	61.2	0	0	3	1
9J	8-Mar	1946	Night	61.2	0	0	3	1
9K	8-Mar	1946	Day	61.2	0	0	3	1
9L	8-Mar	1946	Swing	61.2	0	0	3	1
9M	10-Mar	1946	Day	61.2	0	0	4	1
9N	10-Mar	1946	Swing	61.2	0	0	5	1
9O	11-Mar	1946	Night	61.2	0	0	7	1
10A	8-Apr	1946	Night	67.2	0	0	3	1
10B	8-Apr	1946	Day	67.2	0	0	4	1
10C	8-Apr	1946	Swing	67.2	0	0	3	1
10D	9-Apr	1946	Day	67.2	0	0	4	2
10E	9-Apr	1946	Swing	67.2	0	0	4	2
10F	10-Apr	1946	Night	67.2	0	0	4	1
10G	10-Apr	1946	Swing	67.2	0	0	3	1
10H	11-Apr	1946	Night	67.2	0	0	4	1
10I	11-Apr	1946	Swing	67.2	0	0	5	1
10J	12-Apr	1946	Night	67.2	0	0	5	1
10K	12-Apr	1946	Day	65.7	0	0	4	2
10L	12-Apr	1946	Swing	67.2	0	0	9	1
10M	13-Apr	1946	Day	66.4	0	0	4-7 U	1
10N	14-Apr	1946	Day	67.2	0	0	17-30 U	1
11A	6-May	1946	Night	65.9	0	0	4	1
11B	6-May	1946	Day	66.9	0	0	5	1
11C	6-May	1946	Swing	66.9	0	0	5	1
11D	7-May	1946	Day	66.9	0	0	5	1
11E	7-May	1946	Swing	66.9	0	0	4	1
11F	8-May	1946	Night	66.9	0	0	4	1
11G	8-May	1946	Day	66.3	0	0	4	1
11H	9-May	1946	Swing	66.9	0	0	3	1
11I	9-May	1946	Swing	66.9	0	0	3	1
11J	10-May	1946	Day	66.9	0	0	4	1
11K	10-May	1946	Swing	66.9	0	0	5	1
11L	11-May	1946	Night	66.9	0	0	16	1
11M	11-May	1946	Swing, Beginning	66.9	0	0	11	1
11N	13-May	1946	Day	66.9	0	0	9	1
11O	13-May	1946	Swing	23	0	0	17-30 U	1
12A	10-Jun	1946	Night	64.3	0	0	5	1
12B	10-Jun	1946	Day	65.6	0	0	6	1
12C	10-Jun	1946	Swing	62.4	0	0	6	1
12D	11-Jun	1946	Day	68.1	0	0	5	1
12E	11-Jun	1946	Swing	63.5	0	0	5	1
12F	12-Jun	1946	Night	72.3	0	0	5	1
12G	12-Jun	1946	Swing	64.3	0	0	5	1
12H	13-Jun	1946	Night	64.3	0	0	7	2
12I	13-Jun	1946	4:00 PM	69.7	0	0	6	1
12J	14-Jun	1946	Night	66.6	0	0	4	1

**Appendix 3G: RaLa Dissolving Batches Conducted in X-10's Building 706-D**

Batch Name	Start of Dissolving			No. of Slugs Dissolved			Duration (h)	Direct Release Class
	Date	Year	Shift or Time	X-10	4" Hanf.	8" Hanf.		
12K	14-Jun	1946	Day	64.3	0	0	6	1
12L	14-Jun	1946	Swing	64.3	0	0	4	1
12M	15-Jun	1946	Day	63	0	0	4-14 U	1
12N	16-Jun	1946	Day	64.3	0	0	9-22 U	1
13A	13-Aug	1946	Night	65	0	0	4-14 U	1
13B	13-Aug	1946	Day	65	0	0	4-7 U	1
13C	13-Aug	1946	Swing	65	0	0	4-7 U	2
13D	14-Aug	1946	Night	65	0	0	4-7 U	1
13E?	14-Aug	1946	Unknown	65	0	0	4-8 U	4
13F?	15-Aug	1946	Unknown	65	0	0	4-8 U	4
13G?	15-Aug	1946	Unknown	65	0	0	4-8 U	4
13H?	16-Aug	1946	Unknown	65	0	0	4-8 U	4
13I?	16-Aug	1946	Unknown	65	0	0	4-8 U	4
13J?	17-Aug	1946	Unknown	65	0	0	4-8 U	4
13K?	17-Aug	1946	Unknown	65	0	0	4-8 U	4
13L?	18-Aug	1946	Unknown	65	0	0	4-8 U	4
Heels?	~18-Aug	1946	Unknown	32	0	0	4-8 U	4
14A?	~3-Dec.	1946	Unknown	65	0	0	4-8 U	4
14B?	3-Dec	1946	Unknown	65	0	0	4-8 U	4
14C?	4-Dec	1946	Unknown	65	0	0	4-8 U	4
14D?	5-Dec	1946	Unknown	65	0	0	4-8 U	4
14E?	6-Dec	1946	Unknown	65	0	0	4-8 U	4
14F?	7-Dec	1946	Unknown	65	0	0	4-8 U	4
14G?	8-Dec	1946	Unknown	65	0	0	4-8 U	4
14H?	~9-Dec.	1946	Unknown	65	0	0	4-8 U	4
Heels	11-Dec?	1946	~Night	44	0	0	25-38 U	1
15A	15-Jan	1947	Night	58.4	0	0	4-14 U	1
15B	15-Jan	1947	Day	56.8	0	0	4-14 U	1
15C	15-Jan	1947	Swing	56.5	0	0	4-14 U	1
15D	16-Jan	1947	Day	59	0	0	4-7 U	1
15E	16-Jan	1947	Swing	57	0	0	4-7 U	1
15F	17-Jan	1947	Night	57	0	0	4-14 U	1
15G	17-Jan	1947	Swing	57	0	0	4-14 U	1
15H (heel)	18-Jan	1947	Day	27.6	0	0	25-38 U	1
15I	22-Jan	1947	~8:00:00 AM	57	0	0	4-7 U	1
15J	22-Jan	1947	Swing	57	0	0	4-14 U	1
15K	23-Jan	1947	Night	54.4	0	0	4-14 U	1
15L	23-Jan	1947	Day	57	0	0	4-14 U	1
heels	23-Jan	1947	Swing	30	0	0	17-30 U	1
15A-A	26-Feb	1947	Day	65.3	0	0	4-7 U	1
15A-B	26-Feb	1947	Day	71.5	0	0	4-14 U	1
15A-C	26-Feb	1947	Swing	60	0	0	4-7 U	1
15A-D	27-Feb	1947	Day	75.3	0	0	4-7 U	1
15A-E	27-Feb	1947	Swing	69.3	0	0	4-7 U	1
15A-F	28-Feb	1947	Night	67	0	0	4-7 U	1
15A-G	28-Feb	1947	Day	62	0	0	4-14 U	1
15A-H	29-Feb	1947	Night	67	0	0	4-7 U	1
15A-I (heels)	1-Mar	1947	Day	32	0	0	4-14 U	1

**Appendix 3G: RaLa Dissolving Batches Conducted in X-10's Building 706-D**

Batch Name	Start of Dissolving			No. of Slugs Dissolved			Duration (h)	Direct Release Class
	Date	Year	Shift or Time	X-10	4" Hanf.	8" Hanf.		
16-A	26-Mar	1947	1:00 AM	62.4	0	0	7	1
16-B	26-Mar	1947	Night	61.2	0	0	4-14 U	1
16-C	26-Mar	1947	Day	58.1	0	0	4-14 U	1
16-D	27-Mar	1947	Day	69.5	0	0	4-7 U	1
16-E	27-Mar	1947	Day	69.3	0	0	4-14 U	1
16-F	27-Mar	1947	Swing	72.5	0	0	4-7 U	1
16-G	28-Mar	1947	Night	59	0	0	4-14 U	1
16-H	28-Mar	1947	~5:00 PM	63	0	0	4-7 U	1
16-I	29-Mar	1947	Night	60	0	0	4-14 U	1
16-J heel	29-Mar	1947	Day	45	0	0	4-14 U	1
16-K	1-Apr	1947	Night	62	0	0	4-7 U	1
16-L	2-Apr	1947	Night	62	0	0	4-14 U	2
17-A	21-Apr	1947	Day	74	0	0	4-14 U	2
17-B	21-Apr	1947	Swing	67.3	0	0	4-14 U	2
17-C	22-Apr	1947	Night	60	0	0	4-14 U	1
17-D	22-Apr	1947	Swing	66	0	0	4-7 U	1
17-E	23-Apr	1947	Night	63.7	0	0	4-7 U	1
17-F	23-Apr	1947	~4:00 PM	66.1	0	0	4-7 U	1
17-G	24-Apr	1947	Night	62	0	0	4-7 U	1
17-H	24-Apr	1947	Day	55	0	0	4-14 U	1
17-I	25-Apr	1947	Night	61	0	0	4-7 U	1
17-J	25-Apr	1947	Day	64	0	0	4-14 U	1
17-K	25-Apr	1947	11:00 PM	65	0	0	4-14 U	1
17-L	26-Apr	1947	Day	64	0	0	4-14 U	2
17-M (heels)	28-Apr	1947	Day	31	0	0	4-7 U	1
17-N (heels)	29-Apr	1947	Day	31	0	0	4-14 U	1
17-O (heels)	30-Apr	1947	Night	31	0	0	9-22 U	1
17P	1-May	1947	Day	31	0	0	17-30 U	1
18A	9-Jun	1947	Day	66	0	0	4-14 U	1
18B	9-Jun	1947	Swing	63	0	0	4-14 U	1
18C	10-Jun	1947	Night	62	0	0	9-22 U	1
18D	10-Jun	1947	Swing	69	0	0	4-14 U	1
18E	11-Jun	1947	Night	59	0	0	4-14 U	1
18F	11-Jun	1947	Day	69	0	0	4-14 U	1
18G	12-Jun	1947	Night	68	0	0	4-7 U	1
18H	12-Jun	1947	Swing	70	0	0	4-7 U	1
18I	13-Jun	1947	Night	68	0	0	4-7 U	1
18J	13-Jun	1947	Day	62	0	0	4-14 U	1
18K	13-Jun	1947	Swing	67	0	0	4-7 U	1
18L	14-Jun	1947	Day	65	0	0	4-14 U	1
18M	15-Jun	1947	Night	61	0	0	4-14 U	1
19A	13-Jul	1947	Swing	65	0	0	4-7 U	1
19B	14-Jul	1947	Night	64.6	0	0	4-7 U	1
19C	14-Jul	1947	Day	62.9	0	0	4-7 U	1
19D	15-Jul	1947	Night	68	0	0	4-7 U	1
19E	15-Jul	1947	Day	64.2	0	0	4-7 U	1
19F	15-Jul	1947	Swing	64	0	0	4-7 U	1
19G	16-Jul	1947	Day	59.3	0	0	4-7 U	1
19H	16-Jul	1947	Swing	70	0	0	4-7 U	1
19I	17-Jul	1947	Night	65	0	0	4-7 U	1
19J	17-Jul	1947	Day	70	0	0	4-7 U	1
19K	17-Jul	1947	Swing	65	0	0	4-14 U	1
19L	18-Jul	1947	Day	66.8	0	0	4-7 U	1
19M	18-Jul	1947	Day	59.2	0	0	4-14 U	1
19N	19-Jul	1947	Day	63	0	0	57-70 U	1
20A	10-Aug	1947	Day	63	0	0	4-14 U	1
20B	10-Aug	1947	Swing	61	0	0	4-14 U	1
20C	11-Aug	1947	Night	57.9	0	0	4-14 U	1

**Appendix 3G: RaLa Dissolving Batches Conducted in X-10's Building 706-D**

Batch Name	Start of Dissolving			No. of Slugs Dissolved			Duration (h)	Direct Release Class
	Date	Year	Shift or Time	X-10	4" Hanf.	8" Hanf.		
20D	11-Aug	1947	Swing	68.2	0	0	4-14 U	1
20E	12-Aug	1947	Night	62.6	0	0	4-7 U	1
20F	12-Aug	1947	Day	63	0	0	4-14 U	1
20G	12-Aug	1947	Swing	60	0	0	4-14 U	1
20H	13-Aug	1947	Swing	67.1	0	0	4-14 U	1
20I	14-Aug	1947	Night	67.3	0	0	4-7 U	1
20J	14-Aug	1947	Night	69	0	0	4-14 U	1
20K	14-Aug	1947	Day	62	0	0	4-14 U	1
20L	15-Aug	1947	Night	66	0	0	4-14 U	1
20M	15-Aug	1947	Day	67.3	0	0	4-14 U	1
20N	15-Aug	1947	Swing	64	0	0	4-14 U	1
20-O (heels)	16-Aug	1947	Swing	57.3	0	0	65-78 U	3
20P	19-Aug	1947	Swing	65.7	0	0	9-22 U	2
20Q	20-Aug	1947	Day	65.7	0	0	25-38 U	1
21A	5-Oct	1947	Day	66.0	0	0	4-14 U	1
21B	5-Oct	1947	Swing	78.0	0	0	4-14 U	1
21C	6-Oct	1947	Night	58	0	0	4-14 U	1
21D	6-Oct	1947	Swing	71	0	0	4-14 U	1
21E	7-Oct	1947	Night	68	0	0	4-7 U	1
21F	7-Oct	1947	Day	56	0	0	4-7 U	1
21G	7-Oct	1947	Swing	70	0	0	4-14 U	1
21H	8-Oct	1947	Day	70	0	0	4-14 U	1
21I	8-Oct	1947	Swing	70	0	0	4-14 U	1
21J	9-Oct	1947	Night	65.4	0	0	4-14 U	1
21K	9-Oct	1947	Swing	64.7	0	0	4-7 U	1
21L	10-Oct	1947	Night	64	0	0	4-14 U	1
21M	10-Oct	1947	Swing	60.0	0	0	4-14 U	1
21N	14-Oct	1947	Day	70.6	0	0	4-14 U	1
21O	14-Oct	1947	Swing	65.5	0	0	4-14 U	1
21P	15-Oct	1947	Night	59	0	0	4-14 U	1
21Q	15-Oct	1947	Day	60.7	0	0	4-14 U	1
21R	16-Oct	1947	Swing	65.9	0	0	4-7 U	1
21S	17-Oct	1947	Day	57	0	0	9-22 U	1
21T (heels)	20-Oct	1947	Day	7	0	0	9-22 U	1
22A	9-Nov	1947	Day	64.8	0	0	4-14 U	1
22B	9-Nov	1947	Swing	67.9	0	0	4-7 U	1
22C	10-Nov	1947	Night	66.5	0	0	4-14 U	1
22D	10-Nov	1947	Swing, beginning	70.2	0	0	4-7 U	1
22E	10-Nov	1947	Swing	66.0	0	0	4-14 U	1
22F	11-Nov	1947	Day	68.7	0	0	4-7 U	1
22G	11-Nov	1947	Swing	60.7	0	0	4-7 U	1
22H	12-Nov	1947	Day	67.4	0	0	4-14 U	1
22I	12-Nov	1947	Swing	78.0	0	0	4-7 U	1
22J	13-Nov	1947	Night	69.8	0	0	4-14 U	1
22K	13-Nov	1947	Day	65.4	0	0	4-14 U	1
22L	14-Nov	1947	Night	78.0	0	0	4-14 U	1
22M	15-Nov	1947	Night	65.6	0	0	4-14 U	1
22N	15-Nov	1947	Day	67.0	0	0	4-14 U	1
22O	15-Nov	1947	Swing	57.2	0	0	4-14 U	1
22P	16-Nov	1947	Swing	69.0	0	0	4-7 U	1
22Q	17-Nov	1947	Night	67.7	0	0	4-7 U	1
22R	17-Nov	1947	Night	60.0	0	0	4-14 U	1
22S	17-Nov	1947	Swing	68.2	0	0	4-14 U	1
22T	18-Nov	1947	Night	53.4	0	0	4-14 U	1
22-U (heels)	18-Nov	1947	Swing	57.7	0	0	9-22 U	1
22-V (heels)	19-Nov	1947	Swing	33	0	0	9-22 U	1
23A	~13-Jan.	1948	Unknown	68.8	0	0	4-22 U	4
23B	13-Jan	1948	Unknown	84.1	0	0	4-22 U	4

**Appendix 3G: RaLa Dissolving Batches Conducted in X-10's Building 706-D**

Batch Name	Start of Dissolving			No. of Slugs Dissolved			Duration (h)	Direct Release Class
	Date	Year	Shift or Time	X-10	4" Hanf.	8" Hanf.		
23C	14-Jan	1948	Unknown	76.3	0	0	4-22 U	4
23D	14-Jan	1948	Unknown	69.8	0	0	4-22 U	4
23E	15-Jan	1948	Unknown	72.0	0	0	4-22 U	4
23F	15-Jan	1948	Unknown	64.7	0	0	4-22 U	4
23G	16-Jan	1948	Unknown	75.0	0	0	4-22 U	4
23H	16-Jan	1948	Unknown	69.1	0	0	4-22 U	4
23I	17-Jan	1948	Unknown	77.1	0	0	4-22 U	4
23J	17-Jan	1948	Unknown	76.9	0	0	4-22 U	4
23K	18-Jan	1948	Unknown	75.4	0	0	4-22 U	4
23L	19-Jan	1948	Unknown	68.0	0	0	4-22 U	4
23M	20-Jan	1948	Unknown	43.1	0	0	4-30 U	4
23N	~21-Jan.	1948	Unknown	18	0	0	4-30 U	4
24A	24-Feb	1948	Unknown	65.5	0	0	4-22 U	4
24B	24-Feb	1948	Unknown	68.0	0	0	4-22 U	4
24C	25-Feb	1948	Unknown	60.7	0	0	4-22 U	4
24D	26-Feb	1948	Unknown	72.3	0	0	4-22 U	4
24E	27-Feb	1948	Unknown	68.8	0	0	4-22 U	4
24F	27-Feb	1948	Unknown	67.0	0	0	4-22 U	4
24G	28-Feb	1948	Unknown	72.0	0	0	4-22 U	4
24H	28-Feb	1948	Unknown	66.8	0	0	4-22 U	4
24I	1-Mar	1948	Unknown	70.5	0	0	4-22 U	4
24J	1-Mar	1948	Unknown	66.3	0	0	4-22 U	4
24K	2-Mar	1948	Unknown	70.4	0	0	4-22 U	4
24L	2-Mar	1948	Unknown	60.7	0	0	4-22 U	4
24M	3-Mar	1948	Unknown	50.2	0	0	4-22 U	4
24N	4-Mar	1948	Unknown	27.3	0	0	4-22 U	4
24O	5-Mar	1948	Unknown	66.1	0	0	4-22 U	4
24P	6-Mar	1948	Unknown	60.4	0	0	4-22 U	4
24Q	7-Mar	1948	Unknown	64.3	0	0	4-22 U	4
24R	8-Mar	1948	Unknown	60.0	0	0	4-22 U	4
24S	9-Mar	1948	Unknown	63.6	0	0	4-22 U	4
24T	10-Mar	1948	Unknown	58.6	0	0	4-30 U	4
24U	~11-Mar.	1948	Unknown	13.3	0	0	4-30 U	4
25A	~6-Jul	1948	Unknown	80.9	0	0	4-22 U	4
25B	8-Jul	1948	Unknown	80.2	0	0	4-22 U	4
25C	9-Jul	1948	Unknown	67.1	0	0	4-22 U	4
25D	11-Jul	1948	Unknown	37.9	0	0	4-22 U	4
25E	13-Jul	1948	Unknown	66.3	0	0	4-22 U	4
25F	14-Jul	1948	Unknown	69.6	0	0	4-22 U	4
25G	15-Jul	1948	Unknown	69.5	0	0	4-30 U	4
Heels	~17-Jul	1948	Unknown	58.5	0	0	4-30 U	4
26A	~19-Jul?	1948	Unknown	70.7	0	0	4-22 U	4
26B	19-Jul	1948	Unknown	72.7	0	0	4-22 U	4
26C	19-Jul	1948	Unknown	57.0	0	0	4-22 U	4
26D	20-Jul	1948	Unknown	77.6	0	0	4-22 U	4
26E	20-Jul	1948	Unknown	72.7	0	0	4-22 U	4
26F	20-Jul	1948	Unknown	78.9	0	0	4-22 U	4
26G	21-Jul	1948	Unknown	72.2	0	0	4-22 U	4
26H	21-Jul	1948	Unknown	76.2	0	0	4-22 U	4
26I	21-Jul	1948	Unknown	77.5	0	0	4-22 U	4
26J	22-Jul	1948	Unknown	75.1	0	0	4-22 U	4
26K	22-Jul	1948	Unknown	73.7	0	0	4-22 U	4
26L	22-Jul	1948	Unknown	78.4	0	0	4-22 U	4
26M	23-Jul	1948	Unknown	70.6	0	0	4-22 U	4
Heels 2	23-Jul	1948	Unknown	71.1	0	0	4-22 U	4
Heels 3	23-Jul	1948	Unknown	66.5	0	0	4-22 U	4
Heels 4	24-Jul	1948	Unknown	57.0	0	0	4-30 U	4
Heels 5	24-Jul	1948	Unknown	8.6	0	0	4-30 U	4

**Appendix 3G: RaLa Dissolving Batches Conducted in X-10's Building 706-D**

Batch Name	Start of Dissolving			No. of Slugs Dissolved			Duration (h)	Direct Release Class
	Date	Year	Shift or Time	X-10	4" Hanf.	8" Hanf.		
27A	25-Aug	1948	Swing	57.5	0	0	4-14 U	1
27B	26-Aug	1948	Night	62.5	0	0	4-7 U	1
27C	26-Aug	1948	Night	54.2	0	0	4-22 U	1
27D	26-Aug	1948	Swing	62.5	0	0	4-14 U	1
27E	27-Aug	1948	Night	60.3	0	0	4-14 U	1
27F	27-Aug	1948	Day	57.6	0	0	4-14 U	1
27G	27-Aug	1948	Swing	60.2	0	0	4-14 U	1
27H	28-Aug	1948	Night	63.4	0	0	4-22 U	1
27I	28-Aug	1948	Swing	69.8	0	0	4-14 U	1
27J	29-Aug	1948	Night	58.8	0	0	4-14 U	1
27K	29-Aug	1948	Day	58.1	0	0	4-14 U	1
27L	29-Aug	1948	Swing	55.6	0	0	4-14 U	1
27M	30-Aug	1948	Night	61.7	0	0	4-22 U	1
27N	30-Aug	1948	Swing	52.6	0	0	4-14 U	1
27-O (Heel)	31-Aug	1948	Night	3.1	0	0	4-22 U	1
28A	18-Nov	1948	Night	0	32.7	0	9-22 U	1
heels	19-Nov	1948	Day	0	3.6	0	9-22 U	1
29A	11-Jan	1949	4:25 AM	0	27.7	0	9-22 U	1
29B	12-Jan	1949	Night	0	10.0	0	4-14 U	1
30A	15-Feb	1949	Day	59.3	3.9	0	4-7 U	1
30B	15-Feb	1949	Day	56.6	3.7	0	4-14 U	1
30C	15-Feb	1949	Swing	47.0	3.1	0	4-14 U	1
30D	16-Feb	1949	Day	52.8	3.4	0	4-14 U	1
30E	16-Feb	1949	Swing	56.1	3.6	0	4-7 U	1
30F	17-Feb	1949	Day	37.9	2.5	0	9-22 U	1
heels	19-Feb	1949	Day	0.47	0.03	0	9-22 U	1
30A-A	22-Feb	1949	Night	64.7	4.2	0	4-7 U	1
30A-B	22-Feb	1949	8:00 AM	57.2	3.7	0	4-7 U	1
30A-C	22-Feb	1949	Day, middle	54.5	3.5	0	4-7 U	1
30A-D	23-Feb	1949	Night	54.0	3.5	0	2	2
30A-E	23-Feb	1949	Day	50.4	3.3	0	4-7 U	1
30A-F	24-Feb	1949	Day, beginning	9.9	0.6	0	9-22 U	1
31A	20-Mar	1949	Day	0	35.8	0	4-14 U	1
31B	20-Mar	1949	Swing	0	35.6	0	9-22 U	1
heels	21-Mar	1949	Swing	0	3.9	0	4-14 U	1
32A	18-Apr	1949	Night	0	36.8	0	4-14 U	2
32B	18-Apr	1949	Day	0	32.9	0	9-22 U	2
heels	19-Apr	1949	Night	0	6.0	0	9-22 U	1
33A	24-May	1949	Night	0	40.8	0	4-14 U	1
33B	24-May	1949	Swing	0	33.0	0	4-14 U	1
heels	24-May	1949	Day	0	4.6	0	4-14 U	1
34A	10-Jul	1949	Swing ~ 11 PM	0	34.6	0	9-22 U	1
34B	11-Jul	1949	Day	0	32.0	0	4-14 U	1
heels	12-Jul	1949	Night	0	6.4	0	4-14 U	1

**Appendix 3G: RaLa Dissolving Batches Conducted in X-10's Building 706-D**

Batch Name	Start of Dissolving			No. of Slugs Dissolved			Duration (h)	Direct Release Class
	Date	Year	Shift or Time	X-10	4" Hanf.	8" Hanf.		
35A	15-Aug	1949	Day	0	35.9	0	4-14 U	1
35B	15-Aug	1949	Swing	0	35.1	0	9-22 U	1
heels	16-Aug	1949	Day	0	1.5	0	4-14 U	1
36A	10-Oct	1949	Night	0	40.7	0	4-14 U	1
36B	10-Oct	1949	Day	0	30.7	0	9-22 U	1
heels	11-Oct	1949	Night	0	4.0	0	9-22 U	1
37A	21-Nov	1949	Night	0	34.8	0	4-14 U	1
37B	21-Nov	1949	Day	0	30.9	0	9-22 U	1
heels	22-Nov	1949	Night	0	6.2	0	9-22 U	1
38A	2-Jan	1950	Night, ~ 7 AM	0	37	0	9	1
38B	2-Jan	1950	Swing	0	31	0	4-14 U	1
heels	3-Jan	1950	Day	0	6.8	0	4-14 U	1
39A	16-Jan	1950	Day	0	21.57	0	4-14 U	2
39B	17-Jan	1950	Night?	0	25.3	0	4-7 U	1
39C	18-Jan	1950	Day	0	29.1	0	4-14 U	1
heels "B"?	19-Jan	1950	Night?	0	19	0	9-22 U	1
40A	13-Mar	1950	Day, ~4 PM	0	40.85	0	8	1
40B	14-Mar	1950	Night	0	40.95	0	9-22 U	1
heels	14-Mar	1950	Swing	0	5	0	9-22 U	1
41A	9-Apr	1950	Day	0	36.8	0	9-22 U	1
41B	10-Apr	1950	Night	0	31.0	0	4-14 U	1
heels	10-Apr	1950	Swing	0	6.5	0	17-30 U	1
42A	11-Jun	1950	Swing	0	36.6	0	4-14 U	1
42B	12-Jun	1950	Day	0	38.0	0	4-14 U	1
42C	13-Jun	1950	Night	0	20.5	0	4-14 U	1
Heels	13-Jun	1950	Swing	0	1.2	0	4-14 U	1
43A	2-Apr	1951	Day	58.6	0	0	9-22 U	1
heels	3-Apr	1951	Night	11.5	0	0	49-62 U	1
44A	14-May	1951	Night	0	38.1	0	4-14 U	1
44B	14-May	1951	Swing	0	29.5	0	4-14 U	1
heels	15-May	1951	Day, early	0	1.9	0	4-22 U	1
45A	13-Aug	1951	Day	0	41.2	0	4-14 U	1
45B	3-Aug	1951	Swing	0	41.9	0	4-14 U	1
45C	14-Aug	1951	Night	0	39.9	0	4-14 U	1
45D	15-Aug	1951	Day	0	24.2	0	9-22 U	1
46A	13-Jan	1952	Day	0	39.4	0	4-14 U	1
46B	13-Jan	1952	Swing	0	38.9	0	4-14 U	1
46C	14-Jan	1952	Night	0	39.3	0	4-14 U	1
46D	14-Jan	1952	Day	0	36.7	0	4-14 U	1
46E	14-Jan	1952	Swing, ~11 PM	0	22.1	0	9-22 U	1
47A	1-Jun	1952	Day	0	46.6	0	4-14 U	1
47B	1-Jun	1952	Swing	0	43.6	0	4-7 U	1
47C	2-Jun	1952	Night, beginning	0	41.2	0	4-7 U	1
47D	2-Jun	1952	Night	0	33.5	0	4-14 U	1
47E	2-Jun	1952	Day	0	39.1	0	4-14 U	1
47F	2-Jun	1952	Swing	0	37.2	0	4-14 U	1
47-G (heels)	3-Jun	1952	Night	0	19.3	0	41-54 U	1
48A	29-Jun	1952	Day	0	42.6	0	4-7 U	1
48B	29-Jun	1952	Swing, ~ 11:30 PM	0	40.3	0	4-14 U	1
48C	30-Jun	1952	Night, ~ 8 AM	0	41.7	0	4-7 U	1
48D	30-Jun	1952	Day	0	37.5	0	4-14 U	1
48E	30-Jun	1952	Swing	0	32.0	0	4-14 U	1
48F	1-Jul	1952	Day	0	19.5	0	4-14 U	1
49A	29-Jul	1952	Swing	0	40.4	0	4-7 U	1
49B	30-Jul	1952	12 MN	0	37.4	0	4-7 U	1

**Appendix 3G: RaLa Dissolving Batches Conducted in X-10's Building 706-D**

Batch Name	Start of Dissolving			No. of Slugs Dissolved			Duration (h)	Direct Release Class
	Date	Year	Shift or Time	X-10	4" Hanf.	8" Hanf.		
49C	30-Jul	1952	Night	0	39.2	0	4-14 U	1
49D	30-Jul	1952	Day	0	38.7	0	4-14 U	1
49E	30-Jul	1952	Swing	0	38.5	0	4-14 U	1
49F	31-Jul	1952	Night	0	25.7	0	9-22 U	1
heels	31-Jul	1952	Swing	0	2.3	0	9-22 U	1
50A	19-Aug	1952	Swing	0	20.88	0	4-7 U	1
50B	20-Aug	1952	Night	0	20.5	0	4-7 U	1
50C	20-Aug	1952	Night	0	20.1	0	4-14 U	1
50D	20-Aug	1952	4:00 PM	0	18.3	0	8	1
50E	21-Aug	1952	Night	0	14.7	0	4-14 U	1
50F	21-Aug	1952	Day	0	11.2	0	9-22 U	1
51A	24-Sep	1952	Swing		18.48	0	4-14 U	1
51B	25-Sep	1952	Night		18.94	0	4-14 U	1
51C	25-Sep	1952	Day		20.42	0	4-14 U	1
51D	25-Sep	1952	Swing		18.60	0	4-14 U	1
51E	26-Sep	1952	Night		17.54	0	4-14 U	1
51F	26-Sep	1952	Swing, ~ 6 PM		12.36	0	4-14 U	1
heels	27-Sep	1952	Night		1	0	4-14 U	1
52A	24-May	1953	Night			18.12	4-14 U	1
52B	24-May	1953	5:30 PM			18.89	10	1
52C	25-May	1953	6:15 AM			16.65	9	1
52D	25-May	1953	5:20 PM			15.23	12	1
heels	26-May	1953	Day			4.27	9-22 U	1
53A	4-Jul	1953	1:30 PM			17.1	3	1
53B	4-Jul	1953	8:38 PM			17.1	4-14 U	1
53C	5-Jul	1953	Night			17.0	4-14 U	1
53D	5-Jul	1953	9:30 AM			20.3	8	1
53A-E	5-Jul	1953	6:20 PM			16.1	22	2
53A-F	6-Jul	1953	Swing			20.3	4-14 U	1
53A-G	7-Jul	1953	Night			16.8	15-23 U	1
54A	5-Nov	1953	8:20 PM		22.4	10.98	4	1
54B	6-Nov	1953	Night		22.3	10.89	3-6 U	1
54C	6-Nov	1953	Night		24.1	11.79	4-14 U	1
54D	6-Nov	1953	Swing, beginning		24.7	12.06	4-7 U	2
54E	11-Nov	1953	Night		19.5	9.54	4-7 U	1
54F	11-Nov	1953	Day		21.2	10.35	4-14 U	1
54G	18-Nov	1953	20:40		16.9	8.28	6	1
54H	19-Nov	1953	8:50		15.8	7.74	7	1
54I	19-Nov	1953	22:15		12.8	6.264	8	1
54J	20-Nov	1953	3:40		4.0	1.962	15	1
55A	16-Jan	1954	21:00			20.82	3	1
55B	17-Jan	1954	2:00 AM			20.8	4-7 U	1
55C	17-Jan	1954	Day			20.3	4-7 U	1
55D	17-Jan	1954	Day			20.3	4-14 U	2
55E	18-Jan	1954	22:15			16.29	4-14 U	2
55F	19-Jan	1954	Night			20.3	4-14 U	1
55G	19-Jan	1954	Day			20.3	4-14 U	1
55A-H	20-Jan	1954	12:00 MN			20.3	4-7 U	1
55A-I	20-Jan	1954	Day			17.51	4-14 U	1
55A-J	21-Jan	1954	Night			20.3	4-14 U	1

**Appendix 3G: RaLa Dissolving Batches Conducted in X-10's Building 706-D**

Batch Name	Start of Dissolving			No. of Slugs Dissolved			Duration (h)	Direct Release Class
	Date	Year	Shift or Time	X-10	4" Hanf.	8" Hanf.		
56A	26-Apr	1954	19:14			18	4	4
56B	27-Apr ??	1954	Unknown			18	4-14 U	4
56C	28-Apr ??	1954	Day?			18	4-14 U	4
56E?	2-May ??	1954	Night?			18	4-14 U	4
56F?	3-May ??	1954	Unknown			18	4-14 U	4
56G?	3-May ??	1954	Unknown			18	4-14 U	4
56H?	4-May ??	1954	Unknown			18	4-14 U	4
56I?	4-May??	1954	Unknown			17	4-14 U	4
57A	17-Jul	1954	Day (~4 PM)			18.05	8	1
57B	18-Jul	1954	2:35 AM			15.06	4-14 U	1
57C	18-Jul	1954	Day			15.06	4-14 U	1
57D	19-Jul	1954	Night (~2 AM)			14	4-14 U	1
heels	20-Jul	1954	Swing (~11 PM)			7.53	13	1
58A	23-Oct	1954	Day			21.1	4-7 U	2
58B	23-Oct	1954	Swing			20.8	4-14 U	1
58C	24-Oct	1954	Day			17.8	4-14 U	1
58D	24-Oct	1954	Swing			15.0	4-14 U	1
58E	25-Oct	1954	Day			11.4	4-14 U	1
59A	2-Mar	1955	Day (~4 PM)			18.9	6	1
59B	2-Mar	1955	23:10			17.8	4-14 U	1
59C	3-Mar	1955	Night			19.2	4-14 U	1
59D	3-Mar	1955	Swing			19.2	4-14 U	1
59E	4-Mar	1955	4:50 AM			11.6	9-22 U	1
60A	15-Apr	1955	Swing			18.05	4-7 U	1
60B	16-Apr	1955	Night			17.72	4-7 U	1
60C	16-Apr	1955	Day			17.72	4-14 U	2
60D	16-Apr	1955	Swing			17.72	4-14 U	2
60E	17-Apr	1955	Night (6:30 AM)			13.12	9-22 U	1
61A	18-Jul	1955	Day (2:50 PM)			2.48	9-22 U	1
heels	19-Jul	1955	Day			1.52	9-22 U	1
62A	28-Aug	1955	Day			14.95	9-22 U	1
62B	29-Aug	1955	Night			17.55	9-22 U	1
62C	29-Aug	1955	Swing			16.44	4-14 U	1
62D	30-Aug	1955	Night			18.66	4-14 U	1
63A	2-Oct	1955	Swing ( 10 PM)			21.84	4-14 U	1
63B	3-Oct	1955	Night			21.04	4-14 U	1
63C	3-Oct	1955	Day			18.56	4-14 U	1
63D	3-Oct	1955	Swing			18.56	4-14 U	1
63E (heels)	4-Oct	1955	Night ( 7 AM)			9	9-22 U	1
64A	15-Jan	1956	Swing			20.93	4-14 U	1
64B	16-Jan	1956	Night			20.93	4-14 U	1
64C	16-Jan	1956	Day			20.93	4-14 U	1
64D	16-Jan	1956	Swing			20.93	4-14 U	1
64E?	17-Jan?	1956	Assume Night			9.3	4-14 U	1
65A	23-Mar	1956	Day			21.3	4-14 U	1
65B	23-Mar	1956	Swing			21.3	4-14 U	1
65C	24-Mar	1956	Night			21.3	4-14 U	1
65D	24-Mar	1956	Day			7.1	4-14 U	1
66A	8-May	1956	Swing			25.59	4-14 U	1
66B	9-May	1956	Night			25.59	4-14 U	1
66C	9-May	1956	Day			25.59	4-14 U	1
66D	9-May	1956	Assume Swing			8.53	9-30 U	1

**Appendix 3G: RaLa Dissolving Batches Conducted in X-10's Building 706-D**

Batch Name	Start of Dissolving			No. of Slugs Dissolved			Duration (h)	Direct Release Class
	Date	Year	Shift or Time	X-10	4" Hanf.	8" Hanf.		
67A	9-Sep	1956	Swing (middle)			19.38	4-14 U	1
67B	10-Sep	1956	Night (middle)			19.38	4-14 U	1
67C	10-Sep	1956	Day			19.38	4-14 U	1
67D	10-Sep	1956	Day or Swing			19.38	4-14 U	1
67E	10-Sep	1956	Assume Swing			19.38	9-30 U	1
67F	11-Sep	1956	Assume Night, End			19.38	4-22 U	1
67G	11-Sep	1956	Swing			12.92	4-14 U	1
68A	21-Oct	1956	Swing			21.54	4-14 U	1
68B	22-Oct	1956	Night			21.54	4-14 U	1
68C	22-Oct	1956	Day			21.54	4-14 U	1
68D	22-Oct	1956	Swing			7.18	4-22 U	1

**APPENDIX 3H**

**DETAILS OF BATCHES FOR WHICH NUMBERS OF  
SLUGS DISSOLVED WERE ESTIMATED**

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### Appendix 3-H: Details of Batches for which Numbers of Slugs Dissolved were Estimated

Run 1: 208 slugs apportioned to 4 batches according to proportions of Ci Ba dissolved in those batches: A: 280 Ci Ba; B: 281 Ci Ba; C: 238 Ci Ba; D: 208 Ci Ba. Total = 1007 Ci Ba.

Run 3: Based on 831 slugs charged. Assigned 25 slugs to 3CD as reported, assigned remaining slugs evenly over remaining 11 batches. Report says ~60 effective slugs per batch rather than ~50 in previous runs.

Run 4: CF45-8-219 says 12 batches x 50 effective slugs per batch. Ops. log says there were 22 batches.  $22 \times 50$  is in close agreement with the 1144 slugs reported charged.  $1144/22=52$ ; assigned 52 to each batch.

Run 5: Reported 16 batches with average 61.5 effective slugs dissolved in each. Ops. log shows 18 batches; assigned 61.5 slugs to each.

Run 6: It is reported that the first 7 batches averaged 85 effective slugs dissolved; other 4 batches were at "normal levels." Assigned 60 slugs to the last 4 non-heel batches. Average over 11 batches reported as 77.6 slugs;  $11 \times 77.6 = 853$  slugs;  $853 - (7 \times 85 + 4 \times 60) = 18$ ;  $18/2 = 9$  for each heel batch.

Run 7: Report indicates 7 batches x 86.3 effective slugs dissolved in each. Ops. log shows 14 batches. The batches after the first 7 may not have been used for the product, but dissolvings appear to have occurred. Reported 924 slugs charged / 14 batches = 66 per batch.

Run 8: Reported 17 batches with average 79.2 effective slugs dissolved in each. It is also recorded that 72 eff. slugs were dissolved in Batch 8-F. Therefore:  $[(79.2 \times 17) - (72)] / 16 = 79.65$  eff. slugs in each of the remaining 16 batches.

Run 9: Reported average 61.2 effective slugs dissolved in each of 15 batches.

Run 10: Reported 67.2 slugs averaged over 12 batches. But Ops. log indicates 14 dissolvings took place. Therefore, assigned 67.2 slugs to each batch for which we do not have reported slugs dissolved.

Run 11: Reported avg. 66.8 slugs dissolved over 14 batches (heels not included, but we have a reported eff. slugs dissolved for the heels).

Run 12: Reported average 64.3 slugs over 12 batches. But logs indicate 14 dissolvings occurred. Therefore assigned 64.3 slugs to each batch with no report of slugs dissolved.

Run 13: 812 slugs dissolved per ORNL-246 Special. At 64.3 slugs/batch from previous run, would have been ~12.6 batches. Assigned 65 slugs to 12 batches and 32 to a heel batch.

Run 14: 564 slugs dissolved per ORNL-246 Special. At 64.3 slugs/batch from Run 12, would have been ~8.77 batches. Assigned 65 slugs to 8 batches and 44 to a heel batch.

Run 15: Where necessary, assigned the average of reported slugs/batch values from non-heel Run 15 batches. Average of 5 values = 57 eff. slugs.

Run 16: Report says 10 batches at average 62.0 effective slugs dissolved per batch. Ops. log indicates 12 batches. Assigned 62 effective slugs to each batch for which we do not have an analysis value.

Run 17: ORNL-246 Special says 892 slugs were dissolved.  $12 \times 64$  accounts for 768; the remaining 124 slugs were divided among the 4 final "heel" batches (31 to each).

Run 19: ORNL-246 Special says 905 slugs were dissolved. Available analyses account for 842.  $905 - 842 = 63$  slugs assigned to final Batch 19N.

### Appendix 3-H: Details of Batches for which Numbers of Slugs Dissolved were Estimated

Run 20: For Batches 20-P and 20-Q, set slugs dissolved equal to the average for the previous three non-heel batches.

Batch 22-V: Assumed number of slugs dissolved was equal to 50% of the average reported effective slugs per batch value for the run (66.1).

Batch 23-N: Assumed equal to 25% of the average reported effective slugs per batch value for the run (70.8). Analytical report says "N-Heels" and "—" in the Slugs column.

Run 25: Analytical data per ORNL-CF-48-7-152, a 7/13/48 memo from Wyatt to Emllet. Poor copy— some values difficult to read, but batches add up to correct total.

Run 26: Analytical data indicate 1215 effective slugs were dissolved.

Batch 39-B: Assumed equal to average of effective slugs dissolved values for preceding and subsequent batches.

Run 51: No slugs dissolved value given for heels. Total charged = 107, minus 106.34 by analysis leaves ~ 1 effective slug for the heel batch.

Run 54: The 184 4" Hanford and 90 8" Hanford slugs used were apportioned according to distribution of Ci of Ba dissolved in batches A thru J (A thru I from CF53-12-19, J from Ops log A-453 11/20/53 Swing shift). For each batch, the fraction of total Ba dissolved was multiplied times 184 to estimate the number of 4"W slugs dissolved and by 90 to estimate the number of 8"W slugs dissolved.

Run 55: The Ops. log indicates 197 slugs were charged to the dissolver. 75.42 are accounted for in analysis results we have. The remaining 121.58 were assigned evenly to the other 6 batches.

Run 56: The April 30, 1954 memo from Stanley to Larson indicates that three dissolvings of about 18 slugs each had occurred before the 4th cut was started. Logs show that 161 slugs were charged on 4/26 and 4/27 (this conflicts with Stanley's memo, which says 101 Hanford slugs were loaded). Assumed 18 slugs dissolved in Batches A-H, 17 in Batch 56-I. Releases from the Batch 56-D accident are handled separately.

Run 57: ORNL-CF-54-8-56 indicates 69.7 effective 8" Hanford slugs were dissolved. Analytical data is in Ops. logs for two batches; the remaining 37.65 effective slugs were apportioned to the other 3 batches as follows: 40% to each main batch and 20% to the heel batch.

Run 58: The Ops. log indicates 86 slugs were loaded. The Ops. log indicates Ci Ba for 4 of the 5 batches as 9829, 9705, 8291, —, 5325. A value of 7000 Ci was estimated for Batch D to follow the observed trend. The 86 slugs reported dissolved were then apportioned to the 5 batches according to the fraction of total Ci Ba dissolved in each.

Run 59: ORNL-CF-55-4-10 states that 86.6 effective 8" Hanford slugs were dissolved. The Ops. log gives Ci Ba and effective slugs values for Batch 59-A; this was used to determine Ci Ba per slug as  $7922/18.9=419.15$ . Used this value to convert 7475 Ci Ba for Batch 59-B to 17.8 slugs and 4860 Ci Ba for Batch 59- E to 11.6 slugs. This left 38.3 slugs from the total 86.6 slugs; which were divided evenly across Batches 59-C and -D.

Run 60: ORNL-CF-55-5-82 indicates that 84.4 effective 8" Hanford slugs were dissolved. The Ops. logs attribute 18.05 slugs to Batch 60-A and 13.12 slugs to Batch 60-E. This left 53.15 out of the 84.4; there were divided evenly between Batches 60-B, C, and D.

Run 61: ORNL-CF-55-8-7 indicates that 4 effective 8" Hanford slugs were dissolved. 50 X slugs were also used, but they were "old ones". The Ops. log attributes 1423 Ci Ba to Batch 61-A and 870 Ci Ba to Batch 61-B (heels). Assigned the 4 slugs to Batches 61-A and -B in same proportions.

### **Appendix 3-H: Details of Batches for which Numbers of Slugs Dissolved were Estimated**

Run 62: ORNL-CF-55-10-12 indicates that 67.6 effective 8" Hanford slugs were dissolved. The Ops. log gives the values shown for Batches 62-A, B, and C. They sum to 48.94, leaving 18.66 from the 67.6 for Batch 62-D.

Run 63: Logs show 89 slugs were charged. The Ops. log gives Ci Ba for Batches 63-A, B, C, and D. Assumed 90% of charged slugs (80 slugs) were dissolved in the 4 batches and 10% (9 slugs) in the heel batch. Assigned the 80 slugs to the 4 batches in same proportions as the Ci of Ba dissolved in each (i.e., 11,350; 10,940; 9,679; 9,666).

Run 64: ORNL-CF-56-2-18 indicates that 93 effective 8" Hanford slugs were dissolved. Assumed 90% were dissolved in 4 batches and 10% in the heel batch.

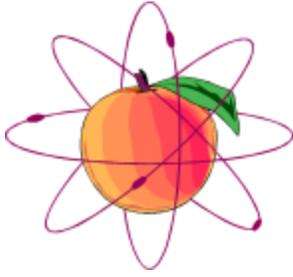
Run 65: ORNL-CF-56-4-63 indicates that 71 8" Hanford slugs were dissolved. Assumed 90% were dissolved in the 3 batches and 10% were dissolved in the final batch.

Run 66: ORNL-CF-56-6-49 indicates that 85.3 effective 8" Hanford slugs were dissolved. Assumed 90% were dissolved in the first 3 batches and 10% in the final batch.

Run 67: ORNL-CF-56-9-104 indicates that 129.2 effective 8" Hanford slugs were dissolved. Assumed 90% were dissolved in the first 6 batches and 10% in the final batch.

Run 68: ORNL-CF-56-11-28 indicates that 71.8 effective 8" Hanford slugs were dissolved. Assumed 90% were dissolved in the first 3 batches and 10% in the final batch.

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## APPENDIX 3I

April 30, 1997

TO: Tom Widner  
ChemRisk - Alameda

FROM: R. E. Burns, Jr.  
Shonka Research Associates, Inc.

SUBJECT: Final inventory values for X-slugs

MEMO NO: REB.002 C97

FINAL  DRAFT

Distribution:  
Talaat Ijaz - ChemRisk - Cleveland  
Joe Shonka - Shonka Research Associates, Inc.

### References:

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8. Heeb, C. M.; "Uncertainties in Source Term Calculations Generated by the ORIGEN2 Computer Code for Hanford Production Reactors" PNL-7223 HEDR, Pacific Northwest Laboratory, March, 1991.

Memo:

This memo describes briefly the final calculations performed to establish the average inventory per slug at discharge for X-slugs irradiated in the Clinton pile for RaLa production, including treatment of uncertainties.

### **Inventory Calculations**

Inventory calculations for X-slugs proceeded as follows:

1. establish the operating power level for the pile for each eight hour shift from 7/27/44 to 12/5/47
2. establish the charge and discharge dates for all slugs pushed for each RaLa run
3. for each charge and discharge date, establish the shift on which the slugs were charged and discharged
4. calculate the peak slug inventory for each group pushed for each run
5. establish the position factors for each slug in each group pushed
6. sum up the total inventory for each group pushed for each run for selected isotopes (in terms of both grams and curies)
7. sum up total inventories for each isotope for each run (i.e., sum up the data for each channel)
8. divide the totals for each run by the number of slugs pushed and their mass to get the average content per slug and per kilogram of uranium
9. compute the average content per slug and per kilogram of uranium for each isotope over all RaLa runs in which X-slugs were used for which push data had been obtained

The operating power levels for the pile for each shift were computed by taking the accumulated power (in kWh) recorded in the pile operations logbooks for each shift and dividing this value by 8.0 hours. This task required pile operations logbooks volumes 6 through 21. These data were compiled in a DOS file called SCHEDULE, an excerpt from which is shown in Fig. 1 below.

Charge and discharge dates for each channel pushed were taken directly from the push data for each run. There are two runs in the period from 1945 to 1947 for which we could not locate complete push data. These were runs 17 (April of 1947) and 20 (August of 1947). In addition, no push data was located for any of the X-slug runs conducted in 1948 (Runs 23 through 27). Note that in many cases the slugs pushed from a given channel for a given run were charged on different dates. When this occurred, group numbers were used to keep up with each set of slugs from the same channel that had a

unique irradiation history. Channels for which all of the slugs had the same irradiation history were assigned the group number 1 by default.

**Figure 1 Excerpt from the SCHEDULE file**

DATE	SHIFT	SHIFT POWER	POWER TO DATE (kWh)	AVERAGE POWER FOR SHIFT (kW)
7/27/44	12 - 8	24912	5724722	3114.000
7/27/44	8 - 4	7000	5731722	875.000
7/27/44	4 - 12	8942	5740664	1117.750
7/28/44	12 - 8	24905	5765569	3113.125
7/28/44	8 - 4	17655	5783224	2206.875
7/28/44	4 - 12	24160	5807384	3020.000
7/29/44	12 - 8	25146	5832530	3143.250
7/29/44	8 - 4	17206	5849736	2150.750
7/29/44	4 - 12	24583	5874319	3072.875
7/30/44	12 - 8	24422	5898741	3052.750
7/30/44	8 - 4	23742	5922483	2967.750
7/30/44	4 - 12	24268	5946751	3033.500
7/31/44	12 - 8	24920	5971671	3115.000
7/31/44	8 - 4	21250	5992921	2656.250
7/31/44	4 - 12	22855	6015776	2856.875

While the push data retrieved for each run gave the charge and discharge dates for each group of slugs, it did not give the shift on which the charge or discharge took place. This information was taken from the pile operations logbooks for each group of slugs and was documented along with the push data. The complete set of charge and discharge data for all of the runs for which such was available was compiled in a DOS file called SLUGLIST. An excerpt from SLUGLIST is presented in Fig. 2 below.

**Figure 2 Excerpt from the SLUGLIST file**

PUSH DATA FOR RALA RUN 01				CHARGED		DISCHARGED	
CHANNEL NO.	GROUP	SLUGS	DAYS	DATE	SHIFT	DATE	SHIFT
2069	1	29	302	7/27/44	4 - 12	5/25/45	8 - 4
1967	1	30	232	10/5/44	8 - 4	5/25/45	8 - 4
1968	1	30	232	10/5/44	8 - 4	5/25/45	8 - 4
1969	1	30	232	10/5/44	8 - 4	5/25/45	8 - 4
1970	1	30	232	10/5/44	8 - 4	5/25/45	8 - 4
1767	1	30	232	10/5/44	8 - 4	5/25/45	8 - 4
1771	1	30	210	10/27/44	8 - 4	5/25/45	8 - 4

After all of the needed irradiation history data had been compiled for each run (for which such was available), peak slug inventories were calculated for each group of slugs for each run. Peak slug inventory refers to the inventory that would be calculated for a slug located at the point of maximum flux in the Clinton pile that had the same irradiation history (time of charge and discharge) as a slug group of interest. The peak slug approach was chosen because it was best for calculating inventories for individual slugs based on the quantitative data we had for the Clinton pile. Specifically, we had a factor with which to convert from total pile power to peak flux and we had an expression for computing the relative flux anywhere in the pile with respect to the peak flux. Hence, all inventory calculations

performed for X-slugs were carried out by computing the inventory for a slug located at the point of maximum flux, and then scaling this result down for the actual point of interest using the relative flux equation.

Peak slug inventories were computed using the ORIGEN2.1 computer code. A boiler-plate input file was created that computed the fission product inventories in both grams and curies for a single X-slug (1175 grams of natural uranium) using the CANDUNAU cross-section and fission product yield library file distributed with the code. The uranium was irradiated in eight hour increments starting with the shift on which a group of interest was charged and ending with the shift on which the slugs were discharged. For each eight hour increment, the fuel was irradiated at a flux level corresponding to the peak flux associated with the operating power level for the pile for that particular shift. Power levels were converted to flux using the factor  $3.102 \times 10^5$  neutrons  $\text{cm}^{-2}$   $\text{second}^{-1}$   $\text{watt}^{-1}$  to compute thermal flux, and then multiplying the thermal flux by 3.16 to get total flux for the CANDUNAU model. The basis for power-to-peak-flux factor is given in the section of this memo discussing its associated uncertainty. Calculation of the 3.16 conversion factor is described in SRA calculation SRA-95-003, Rev. 0 [1].

A computer program called ORIGINRS was developed to complete the task of running ORIGIN for each group of slugs for each RaLa run that had a unique irradiation history. Note that not every group of slugs for a given run had a unique history, as many channels would be charged at the same time. Hence, in many cases, a single calculation would provide the needed peak slug data for several groups of slugs. The purpose of the ORIGINRS program was to automate generation of the input files for each ORIGIN calculation and to extend the capability of the code to compute ingrowth over thousands of irradiation steps by running the code in a sequential manner, with the output from a previous run acting as the input for the next. ORIGIN is normally limited to a total of 150 irradiation steps in any given run. In the case of the calculations for Task 1 (where the fuel was irradiated in eight hour increments), this limited us to a 50 day irradiation duration for a single run, which was not sufficient in most cases. The ORIGINRS program read the irradiation history data from the SCHEDULE and SLUGLIST files for a given group of slugs, generated an ORIGIN input file for the first 40 days of irradiation, ran ORIGIN and then used the inventory data generated as the starting inventory in the input for the next 40 days. This cycle was repeated until the total irradiation duration was reached. In each case, ORIGIN was configured to give inventory results at the end of the irradiation cycle and at four hour increments thereafter up through 24 hours of decay time.

After all of the peak slug inventory calculations had been completed, a macro was written in the text editor program BRIEF™ to strip out the desired data and save it in DOS files having a standard format. The data stripped out were grams of each of the species  $^{127}\text{I}$  (stable),  $^{129}\text{I}$ ,  $^{131}\text{I}$ ,  $^{132}\text{I}$ ,  $^{133}\text{I}$ ,  $^{134}\text{I}$ ,  $^{135}\text{I}$ ,  $^{140}\text{Ba}$ , total iodine, and total barium; and curies of these same species with the exception of  $^{127}\text{I}$ . Following this, another computer program was written that read these data files and inserted the data into spreadsheet files that summarized the peak slug inventory data for each group of slugs pushed for each run. These spreadsheets are 23 columns wide, so only a small portion of one of them (for RaLa Run 01) is presented in Fig. 3 below.

**Figure 3 Portion of a peak slug inventory spreadsheet**

Channel Number	Group	Number of Slugs	I-127		I-129		I-131	
			grams	Curies	grams	Curies	grams	Curies
2069	1	29	9.723E-05	N/A	4.365E-04	7.709E-08	8.083E-05	1.002E+01
1967	1	30	7.706E-05	N/A	3.499E-04	6.180E-08	8.060E-05	9.996E+00
1968	1	30	7.706E-05	N/A	3.499E-04	6.180E-08	8.060E-05	9.996E+00
1969	1	30	7.706E-05	N/A	3.499E-04	6.180E-08	8.060E-05	9.996E+00
1970	1	30	7.706E-05	N/A	3.499E-04	6.180E-08	8.060E-05	9.996E+00
1767	1	30	7.706E-05	N/A	3.499E-04	6.180E-08	8.060E-05	9.996E+00
1771	1	30	6.919E-05	N/A	3.157E-04	5.576E-08	8.052E-05	9.986E+00

After the peak slug inventories for each group had been compiled in spreadsheets, the next step was to define the positions of the slugs pushed from each channel for each run. This is straightforward in all but two cases, as the slugs pushed from a given channel were assumed to have been loaded symmetrically (in the axial direction) about the center of the channel. However, for RaLa Runs 01 and 02, not all of the slugs in some of the channels were pushed. Hence, the slug positions had to be chosen to account for the fact that only the west-most slugs were used in these cases. For the purpose of the final X-slug inventory calculations, all channels were assumed to have been charged in the previously named load-centered configuration. Recall that the numbering convention for slug positions is that east slugs are numbered starting with -1 for the first slug east of channel center and west slugs are numbered starting with 1 for the first slug west of center. For each group of slugs for a given channel, slug positions were chosen to reflect the position of the slugs in each group at the time of discharge.

After positions had been established for all of the slugs, the total discharge inventory for each group was computed for each run. A computer program was written that summed up the relative flux values for each slug in a given group and multiplied this sum by the corresponding peak slug inventory for that group. This product was then multiplied by a factor of 0.633 to correct for the fact the peak slug inventory is based on the flux corresponding to a pile experimental hole and not fuel. Two sets of spreadsheets were used for these calculations: one set for results in grams and one for results in curies. However, these are so large that not even an excerpt can be shown here.

After the total inventories for each group had been established for each run, a spreadsheet was created to sum up these data to provide totals for each run. The totals for each run were then divided by both the number of slugs discharged and their total mass to get the average content for each run per slug and per kilogram of uranium. (Mass was computed using the value 1.175 kg uranium per slug.) Finally, the average content data were averaged over all runs to obtain single values that could be used to establish the quantity of selected isotopes in a given number of slugs or mass of uranium for any RaLa campaign in which X-slugs were used. These results are provided in Figures 4 through 9 below.

**Figure 4 Total inventories in grams for X-slug RaLa runs**

Run Number	Total Slugs	Total Mass (kg)	Total Discharge Inventory (grams) for Run								Total Iodine	Total Barium
			I-127	I-129	I-131	I-132	I-133	I-134	I-135	Ba-140		
1	209	245.575	7.572E-03	3.433E-02	7.733E-03	1.366E-04	1.690E-03	1.916E-05	3.467E-04	2.764E-02	5.183E-02	3.837E-01
2	657	771.975	2.010E-02	9.104E-02	2.046E-02	3.497E-04	4.940E-03	1.724E-04	1.371E-03	7.536E-02	1.384E-01	1.022E+00
3	845	992.875	1.804E-02	8.329E-02	3.374E-02	6.229E-04	8.551E-03	2.663E-04	2.289E-03	1.149E-01	1.468E-01	9.904E-01
4	1182	1388.850	3.164E-02	1.449E-01	4.733E-02	8.536E-04	1.164E-02	3.240E-04	3.008E-03	1.675E-01	2.397E-01	1.686E+00
5	1054	1238.450	1.341E-02	6.347E-02	3.954E-02	6.946E-04	9.758E-03	3.365E-04	2.743E-03	1.395E-01	1.300E-01	8.235E-01
6	816	958.800	1.475E-02	6.922E-02	3.383E-02	6.047E-04	8.590E-03	3.058E-04	2.426E-03	1.215E-01	1.297E-01	8.622E-01
7	933	1096.275	2.160E-02	9.966E-02	3.531E-02	6.318E-04	8.991E-03	3.576E-04	2.696E-03	1.284E-01	1.693E-01	1.181E+00
8	1791	2104.425	4.950E-02	2.251E-01	7.102E-02	1.321E-03	1.891E-02	7.266E-04	5.481E-03	2.464E-01	3.721E-01	2.594E+00
9	897	1053.975	1.601E-02	7.474E-02	3.890E-02	7.021E-04	9.824E-03	3.911E-04	2.868E-03	1.369E-01	1.434E-01	9.341E-01
10	866	1017.550	2.188E-02	1.008E-01	3.672E-02	6.557E-04	9.269E-03	3.777E-04	2.732E-03	1.328E-01	1.725E-01	1.197E+00
11	916	1076.300	1.464E-02	6.849E-02	3.806E-02	6.533E-04	8.685E-03	4.033E-04	2.670E-03	1.363E-01	1.336E-01	8.710E-01
12	916	1076.300	1.495E-02	6.948E-02	3.374E-02	6.054E-04	8.470E-03	3.253E-04	2.437E-03	1.205E-01	1.300E-01	8.602E-01
13	819	962.325	2.386E-02	1.071E-01	2.980E-02	5.358E-04	7.608E-03	3.245E-04	2.258E-03	1.070E-01	1.715E-01	1.092E+00
14	643	755.525	1.721E-02	7.897E-02	2.459E-02	4.214E-04	4.868E-03	1.441E-04	1.046E-03	8.926E-02	1.273E-01	9.180E-01
15	819	962.325	1.662E-02	7.767E-02	3.511E-02	6.403E-04	8.769E-03	3.483E-04	2.490E-03	1.213E-01	1.417E-01	9.445E-01
15A	592	695.600	2.152E-02	9.698E-02	2.395E-02	4.370E-04	6.118E-03	2.169E-04	1.702E-03	8.587E-02	1.509E-01	1.092E+00
16	784	921.200	1.365E-02	6.358E-02	3.107E-02	5.480E-04	7.640E-03	2.894E-04	2.199E-03	1.115E-01	1.190E-01	7.896E-01
18	916	1076.300	5.011E-02	2.180E-01	3.459E-02	6.182E-04	8.549E-03	3.139E-04	2.429E-03	1.241E-01	3.146E-01	2.343E+00
19	889	1044.575	3.405E-02	1.488E-01	3.157E-02	5.291E-04	6.707E-03	2.416E-04	1.900E-03	1.152E-01	2.238E-01	1.641E+00
21	1181	1387.675	1.457E-02	7.003E-02	4.688E-02	8.503E-04	1.192E-02	4.910E-04	3.510E-03	1.647E-01	1.483E-01	9.261E-01
22/22A	1279	1502.825	2.422E-02	1.113E-01	4.774E-02	8.652E-04	1.265E-02	5.275E-04	3.792E-03	1.682E-01	2.011E-01	1.343E+00

**Figure 5 Total inventories in curies for X-slug RaLa runs**

Run Number	Total Slugs	Total Mass (kg)	Total Discharge Inventory (curies) for Run								Total Iodine	Total Barium
			I-127	I-129	I-131	I-132	I-133	I-134	I-135	Ba-140		
1	209	245.575	N/A	6.064E-06	9.590E+02	1.411E+03	1.916E+03	5.113E+02	1.218E+03	2.016E+03	6.863E+03	4.277E+03
2	657	771.975	N/A	1.608E-05	2.537E+03	3.611E+03	5.598E+03	4.600E+03	4.815E+03	5.498E+03	2.897E+04	2.588E+04
3	845	992.875	N/A	1.471E-05	4.185E+03	6.433E+03	9.691E+03	7.107E+03	8.041E+03	8.382E+03	4.754E+04	3.985E+04
4	1182	1388.850	N/A	2.560E-05	5.870E+03	8.815E+03	1.320E+04	8.647E+03	1.057E+04	1.222E+04	6.176E+04	5.049E+04
5	1054	1238.450	N/A	1.121E-05	4.904E+03	7.172E+03	1.106E+04	8.981E+03	9.636E+03	1.018E+04	5.704E+04	4.996E+04
6	816	958.800	N/A	1.222E-05	4.195E+03	6.244E+03	9.735E+03	8.162E+03	8.523E+03	8.863E+03	5.074E+04	4.501E+04
7	933	1096.275	N/A	1.760E-05	4.379E+03	6.524E+03	1.019E+04	9.544E+03	9.470E+03	9.364E+03	5.636E+04	5.164E+04
8	1791	2104.425	N/A	3.976E-05	8.808E+03	1.364E+04	2.143E+04	1.939E+04	1.925E+04	1.797E+04	1.155E+05	1.039E+05
9	897	1053.975	N/A	1.320E-05	4.824E+03	7.251E+03	1.113E+04	1.044E+04	1.007E+04	9.991E+03	6.151E+04	5.624E+04
10	866	1017.550	N/A	1.781E-05	4.554E+03	6.771E+03	1.050E+04	1.008E+04	9.596E+03	9.688E+03	5.869E+04	5.435E+04
11	916	1076.300	N/A	1.210E-05	4.721E+03	6.745E+03	9.841E+03	1.077E+04	9.380E+03	9.941E+03	5.985E+04	5.768E+04
12	916	1076.300	N/A	1.227E-05	4.184E+03	6.252E+03	9.598E+03	8.682E+03	8.560E+03	8.790E+03	5.207E+04	4.726E+04
13	819	962.325	N/A	1.892E-05	3.695E+03	5.532E+03	8.622E+03	8.662E+03	7.932E+03	7.806E+03	4.921E+04	4.620E+04
14	643	755.525	N/A	1.395E-05	3.049E+03	4.352E+03	5.518E+03	3.846E+03	3.674E+03	6.512E+03	2.701E+04	2.361E+04
15	819	962.325	N/A	1.372E-05	4.355E+03	6.613E+03	9.936E+03	9.295E+03	8.746E+03	8.848E+03	5.479E+04	5.005E+04
15A	592	695.600	N/A	1.713E-05	2.971E+03	4.512E+03	6.933E+03	5.790E+03	5.979E+03	6.264E+03	3.603E+04	3.191E+04
16	784	921.200	N/A	1.123E-05	3.853E+03	5.660E+03	8.657E+03	7.724E+03	7.726E+03	8.132E+03	4.677E+04	4.236E+04
18	916	1076.300	N/A	3.849E-05	4.289E+03	6.383E+03	9.689E+03	8.376E+03	8.534E+03	9.052E+03	5.149E+04	4.615E+04
19	889	1044.575	N/A	2.629E-05	3.916E+03	5.463E+03	7.601E+03	6.449E+03	6.676E+03	8.408E+03	4.105E+04	3.699E+04
21	1181	1387.675	N/A	1.237E-05	5.814E+03	8.780E+03	1.351E+04	1.310E+04	1.233E+04	1.201E+04	7.589E+04	7.011E+04
22/22A	1279	1502.825	N/A	1.966E-05	5.921E+03	8.936E+03	1.433E+04	1.408E+04	1.332E+04	1.227E+04	8.060E+04	7.467E+04

**Figure 6 Average inventory (grams per slug) for each RaLa run and for all runs combined**

Run Number	Average Discharge Inventory (grams per slug) for Run								Total Iodine	Total Barium
	I-127	I-129	I-131	I-132	I-133	I-134	I-135	Ba-140		
1	3.623E-05	1.643E-04	3.700E-05	6.538E-07	8.088E-06	9.167E-08	1.659E-06	1.322E-04	2.480E-04	1.836E-03
2	3.059E-05	1.386E-04	3.114E-05	5.322E-07	7.518E-06	2.624E-07	2.086E-06	1.147E-04	2.107E-04	1.555E-03
3	2.135E-05	9.857E-05	3.993E-05	7.372E-07	1.012E-05	3.151E-07	2.709E-06	1.360E-04	1.737E-04	1.172E-03
4	2.676E-05	1.226E-04	4.004E-05	7.221E-07	9.851E-06	2.741E-07	2.545E-06	1.417E-04	2.028E-04	1.426E-03
5	1.272E-05	6.022E-05	3.751E-05	6.590E-07	9.258E-06	3.193E-07	2.603E-06	1.324E-04	1.233E-04	7.813E-04
6	1.808E-05	8.483E-05	4.146E-05	7.410E-07	1.053E-05	3.748E-07	2.973E-06	1.489E-04	1.590E-04	1.057E-03
7	2.315E-05	1.068E-04	3.785E-05	6.772E-07	9.637E-06	3.833E-07	2.890E-06	1.376E-04	1.814E-04	1.266E-03
8	2.764E-05	1.257E-04	3.965E-05	7.376E-07	1.056E-05	4.057E-07	3.060E-06	1.376E-04	2.078E-04	1.448E-03
9	1.785E-05	8.332E-05	4.337E-05	7.828E-07	1.095E-05	4.360E-07	3.197E-06	1.527E-04	1.599E-04	1.041E-03
10	2.526E-05	1.164E-04	4.240E-05	7.571E-07	1.070E-05	4.361E-07	3.154E-06	1.533E-04	1.992E-04	1.383E-03
11	1.598E-05	7.478E-05	4.155E-05	7.132E-07	9.481E-06	4.403E-07	2.915E-06	1.487E-04	1.459E-04	9.508E-04
12	1.632E-05	7.586E-05	3.683E-05	6.609E-07	9.247E-06	3.552E-07	2.660E-06	1.315E-04	1.419E-04	9.391E-04
13	2.914E-05	1.308E-04	3.638E-05	6.542E-07	9.290E-06	3.962E-07	2.757E-06	1.306E-04	2.094E-04	1.490E-03
14	2.677E-05	1.228E-04	3.824E-05	6.553E-07	7.571E-06	2.241E-07	1.627E-06	1.388E-04	1.979E-04	1.428E-03
15	2.030E-05	9.484E-05	4.287E-05	7.818E-07	1.071E-05	4.253E-07	3.040E-06	1.481E-04	1.730E-04	1.153E-03
15A	3.634E-05	1.638E-04	4.046E-05	7.381E-07	1.033E-05	3.665E-07	2.875E-06	1.450E-04	2.549E-04	1.844E-03
16	1.741E-05	8.109E-05	3.963E-05	6.990E-07	9.745E-06	3.691E-07	2.805E-06	1.422E-04	1.518E-04	1.007E-03
18	5.471E-05	2.379E-04	3.776E-05	6.749E-07	9.334E-06	3.426E-07	2.652E-06	1.355E-04	3.434E-04	2.558E-03
19	3.830E-05	1.674E-04	3.552E-05	5.952E-07	7.544E-06	2.718E-07	2.137E-06	1.296E-04	2.518E-04	1.846E-03
21	1.234E-05	5.930E-05	3.969E-05	7.200E-07	1.009E-05	4.158E-07	2.972E-06	1.394E-04	1.255E-04	7.841E-04
22/22A	1.894E-05	8.701E-05	3.733E-05	6.765E-07	9.890E-06	4.125E-07	2.965E-06	1.315E-04	1.572E-04	1.050E-03
Average over all runs =	2.506E-05	1.141E-04	3.889E-05	6.938E-07	9.545E-06	3.485E-07	2.680E-06	1.385E-04	1.914E-04	1.334E-03
Standard Deviation =	1.019E-05	4.333E-05	2.840E-06	6.053E-08	1.063E-06	8.625E-08	4.474E-07	9.194E-06	5.207E-05	4.303E-04
C. V. =	40.66%	37.96%	7.30%	8.73%	11.13%	24.75%	16.69%	6.64%	27.21%	32.25%

**Figure 7 Average inventory (grams per kg uranium) for each RaLa run and for all runs combined**

Run Number	Average Discharge Inventory (grams per kg uranium) for Run								Total Iodine	Total Barium
	I-127	I-129	I-131	I-132	I-133	I-134	I-135	Ba-140		
1	3.083E-05	1.398E-04	3.149E-05	5.564E-07	6.884E-06	7.801E-08	1.412E-06	1.125E-04	2.111E-04	1.563E-03
2	2.604E-05	1.179E-04	2.650E-05	4.530E-07	6.399E-06	2.233E-07	1.776E-06	9.762E-05	1.793E-04	1.323E-03
3	1.817E-05	8.389E-05	3.398E-05	6.274E-07	8.612E-06	2.682E-07	2.305E-06	1.157E-04	1.479E-04	9.975E-04
4	2.278E-05	1.044E-04	3.408E-05	6.146E-07	8.384E-06	2.333E-07	2.166E-06	1.206E-04	1.726E-04	1.214E-03
5	1.083E-05	5.125E-05	3.192E-05	5.608E-07	7.879E-06	2.717E-07	2.215E-06	1.127E-04	1.049E-04	6.650E-04
6	1.539E-05	7.219E-05	3.529E-05	6.306E-07	8.960E-06	3.190E-07	2.530E-06	1.267E-04	1.353E-04	8.992E-04
7	1.971E-05	9.091E-05	3.221E-05	5.763E-07	8.202E-06	3.262E-07	2.459E-06	1.171E-04	1.544E-04	1.077E-03
8	2.352E-05	1.070E-04	3.375E-05	6.278E-07	8.988E-06	3.453E-07	2.604E-06	1.171E-04	1.768E-04	1.233E-03
9	1.519E-05	7.091E-05	3.691E-05	6.662E-07	9.321E-06	3.711E-07	2.721E-06	1.299E-04	1.361E-04	8.862E-04
10	2.150E-05	9.910E-05	3.608E-05	6.444E-07	9.109E-06	3.712E-07	2.685E-06	1.305E-04	1.695E-04	1.177E-03
11	1.360E-05	6.364E-05	3.536E-05	6.070E-07	8.069E-06	3.748E-07	2.481E-06	1.266E-04	1.241E-04	8.092E-04
12	1.389E-05	6.456E-05	3.134E-05	5.625E-07	7.870E-06	3.023E-07	2.264E-06	1.120E-04	1.208E-04	7.992E-04
13	2.480E-05	1.113E-04	3.096E-05	5.568E-07	7.906E-06	3.372E-07	2.347E-06	1.112E-04	1.782E-04	1.268E-03
14	2.278E-05	1.045E-04	3.254E-05	5.577E-07	6.444E-06	1.907E-07	1.385E-06	1.181E-04	1.684E-04	1.215E-03
15	1.727E-05	8.071E-05	3.649E-05	6.654E-07	9.112E-06	3.619E-07	2.587E-06	1.260E-04	1.472E-04	9.815E-04
15A	3.093E-05	1.394E-04	3.443E-05	6.282E-07	8.795E-06	3.119E-07	2.447E-06	1.234E-04	2.170E-04	1.569E-03
16	1.482E-05	6.902E-05	3.372E-05	5.949E-07	8.294E-06	3.141E-07	2.388E-06	1.210E-04	1.292E-04	8.571E-04
18	4.656E-05	2.025E-04	3.213E-05	5.743E-07	7.943E-06	2.916E-07	2.257E-06	1.153E-04	2.923E-04	2.177E-03
19	3.260E-05	1.425E-04	3.023E-05	5.065E-07	6.421E-06	2.313E-07	1.819E-06	1.103E-04	2.143E-04	1.571E-03
21	1.050E-05	5.047E-05	3.378E-05	6.127E-07	8.588E-06	3.539E-07	2.529E-06	1.187E-04	1.068E-04	6.674E-04
22/22A	1.612E-05	7.405E-05	3.177E-05	5.757E-07	8.417E-06	3.510E-07	2.523E-06	1.119E-04	1.338E-04	8.937E-04
Average over all runs =	2.132E-05	9.714E-05	3.309E-05	5.904E-07	8.124E-06	2.966E-07	2.281E-06	1.179E-04	1.629E-04	1.135E-03
Standard Deviation =	8.670E-06	3.687E-05	2.417E-06	5.152E-08	9.045E-07	7.341E-08	3.807E-07	7.825E-06	4.432E-05	3.662E-04
C. V. =	40.66%	37.96%	7.30%	8.73%	11.13%	24.75%	16.69%	6.64%	27.21%	32.25%

**Figure 8 Average inventory (curies per slug) for each RaLa run and for all runs combined**

Run Number	Average Discharge Inventory (curies per slug) for Run									
	I-127	I-129	I-131	I-132	I-133	I-134	I-135	Ba-140	Total Iodine	Total Barium
1	N/A	2.901E-08	4.589E+00	6.753E+00	9.167E+00	2.446E+00	5.829E+00	9.648E+00	3.284E+01	2.046E+01
2	N/A	2.447E-08	3.862E+00	5.496E+00	8.520E+00	7.001E+00	7.329E+00	8.369E+00	4.410E+01	3.939E+01
3	N/A	1.741E-08	4.952E+00	7.613E+00	1.147E+01	8.411E+00	9.516E+00	9.920E+00	5.626E+01	4.716E+01
4	N/A	2.165E-08	4.966E+00	7.458E+00	1.116E+01	7.315E+00	8.940E+00	1.034E+01	5.225E+01	4.272E+01
5	N/A	1.064E-08	4.653E+00	6.805E+00	1.049E+01	8.521E+00	9.142E+00	9.660E+00	5.412E+01	4.740E+01
6	N/A	1.498E-08	5.141E+00	7.652E+00	1.193E+01	1.000E+01	1.045E+01	1.086E+01	6.219E+01	5.516E+01
7	N/A	1.887E-08	4.694E+00	6.993E+00	1.092E+01	1.023E+01	1.015E+01	1.004E+01	6.041E+01	5.535E+01
8	N/A	2.220E-08	4.918E+00	7.617E+00	1.197E+01	1.083E+01	1.075E+01	1.004E+01	6.450E+01	5.799E+01
9	N/A	1.472E-08	5.378E+00	8.083E+00	1.241E+01	1.164E+01	1.123E+01	1.114E+01	6.857E+01	6.270E+01
10	N/A	2.056E-08	5.258E+00	7.818E+00	1.213E+01	1.164E+01	1.108E+01	1.119E+01	6.777E+01	6.275E+01
11	N/A	1.321E-08	5.154E+00	7.364E+00	1.074E+01	1.175E+01	1.024E+01	1.085E+01	6.534E+01	6.297E+01
12	N/A	1.339E-08	4.567E+00	6.825E+00	1.048E+01	9.478E+00	9.345E+00	9.596E+00	5.685E+01	5.160E+01
13	N/A	2.310E-08	4.512E+00	6.755E+00	1.053E+01	1.058E+01	9.685E+00	9.531E+00	6.008E+01	5.640E+01
14	N/A	2.169E-08	4.741E+00	6.768E+00	8.581E+00	5.981E+00	5.714E+00	1.013E+01	4.201E+01	3.672E+01
15	N/A	1.675E-08	5.317E+00	8.074E+00	1.213E+01	1.135E+01	1.068E+01	1.080E+01	6.690E+01	6.112E+01
15A	N/A	2.893E-08	5.018E+00	7.621E+00	1.171E+01	9.780E+00	1.010E+01	1.058E+01	6.085E+01	5.390E+01
16	N/A	1.432E-08	4.914E+00	7.219E+00	1.104E+01	9.852E+00	9.855E+00	1.037E+01	5.966E+01	5.403E+01
18	N/A	4.202E-08	4.683E+00	6.968E+00	1.058E+01	9.144E+00	9.317E+00	9.882E+00	5.621E+01	5.038E+01
19	N/A	2.957E-08	4.405E+00	6.145E+00	8.550E+00	7.254E+00	7.509E+00	9.458E+00	4.618E+01	4.161E+01
21	N/A	1.047E-08	4.923E+00	7.434E+00	1.144E+01	1.110E+01	1.044E+01	1.017E+01	6.426E+01	5.937E+01
22/22A	N/A	1.537E-08	4.629E+00	6.987E+00	1.121E+01	1.101E+01	1.041E+01	9.592E+00	6.302E+01	5.838E+01
<b>Average over all runs =</b>		2.016E-08	4.823E+00	7.164E+00	1.082E+01	9.300E+00	9.415E+00	1.010E+01	5.735E+01	5.131E+01
<b>Standard Deviation =</b>		7.652E-09	3.522E-01	6.251E-01	1.204E+00	2.302E+00	1.571E+00	6.709E-01	9.366E+00	1.056E+01
<b>C. V. =</b>		37.96%	7.30%	8.73%	11.13%	24.75%	16.69%	6.64%	16.33%	20.59%

**Figure 9 Average inventory (curies per kg uranium) for each RaLa run and for all runs combined**

Run Number	Average Discharge Inventory (curies per kg uranium) for Run									
	I-127	I-129	I-131	I-132	I-133	I-134	I-135	Ba-140	Total Iodine	Total Barium
1	N/A	2.469E-08	3.905E+00	5.747E+00	7.801E+00	2.082E+00	4.961E+00	8.211E+00	2.795E+01	1.742E+01
2	N/A	2.083E-08	3.286E+00	4.677E+00	7.251E+00	5.959E+00	6.237E+00	7.122E+00	3.753E+01	3.352E+01
3	N/A	1.482E-08	4.215E+00	6.479E+00	9.761E+00	7.158E+00	8.099E+00	8.442E+00	4.788E+01	4.014E+01
4	N/A	1.843E-08	4.227E+00	6.347E+00	9.502E+00	6.226E+00	7.609E+00	8.797E+00	4.447E+01	3.636E+01
5	N/A	9.052E-09	3.960E+00	5.791E+00	8.930E+00	7.252E+00	7.780E+00	8.221E+00	4.606E+01	4.034E+01
6	N/A	1.275E-08	4.375E+00	6.512E+00	1.015E+01	8.513E+00	8.889E+00	9.244E+00	5.293E+01	4.694E+01
7	N/A	1.606E-08	3.995E+00	5.951E+00	9.295E+00	8.706E+00	8.639E+00	8.542E+00	5.141E+01	4.710E+01
8	N/A	1.889E-08	4.186E+00	6.483E+00	1.019E+01	9.214E+00	9.148E+00	8.541E+00	5.490E+01	4.936E+01
9	N/A	1.252E-08	4.577E+00	6.879E+00	1.056E+01	9.903E+00	9.558E+00	9.479E+00	5.836E+01	5.336E+01
10	N/A	1.750E-08	4.475E+00	6.654E+00	1.032E+01	9.906E+00	9.430E+00	9.521E+00	5.767E+01	5.341E+01
11	N/A	1.124E-08	4.386E+00	6.267E+00	9.144E+00	1.000E+01	8.715E+00	9.236E+00	5.561E+01	5.359E+01
12	N/A	1.140E-08	3.887E+00	5.809E+00	8.918E+00	8.067E+00	7.953E+00	8.167E+00	4.838E+01	4.391E+01
13	N/A	1.966E-08	3.840E+00	5.749E+00	8.960E+00	9.001E+00	8.243E+00	8.112E+00	5.114E+01	4.800E+01
14	N/A	1.846E-08	4.035E+00	5.760E+00	7.303E+00	5.091E+00	4.863E+00	8.620E+00	3.575E+01	3.125E+01
15	N/A	1.425E-08	4.525E+00	6.872E+00	1.033E+01	9.659E+00	9.088E+00	9.195E+00	5.694E+01	5.201E+01
15A	N/A	2.462E-08	4.271E+00	6.486E+00	9.967E+00	8.323E+00	8.595E+00	9.006E+00	5.179E+01	4.587E+01
16	N/A	1.219E-08	4.182E+00	6.144E+00	9.398E+00	8.384E+00	8.387E+00	8.828E+00	5.077E+01	4.598E+01
18	N/A	3.576E-08	3.985E+00	5.931E+00	9.002E+00	7.782E+00	7.929E+00	8.410E+00	4.784E+01	4.288E+01
19	N/A	2.516E-08	3.749E+00	5.230E+00	7.277E+00	6.173E+00	6.391E+00	8.049E+00	3.930E+01	3.541E+01
21	N/A	8.913E-09	4.190E+00	6.327E+00	9.733E+00	9.444E+00	8.884E+00	8.658E+00	5.469E+01	5.052E+01
22/22A	N/A	1.308E-08	3.940E+00	5.946E+00	9.539E+00	9.368E+00	8.862E+00	8.164E+00	5.364E+01	4.969E+01
<b>Average over all runs =</b>		1.716E-08	4.104E+00	6.097E+00	9.206E+00	7.915E+00	8.012E+00	8.598E+00	4.881E+01	4.367E+01
<b>Standard Deviation =</b>		6.512E-09	2.998E-01	5.320E-01	1.025E+00	1.959E+00	1.337E+00	5.710E-01	7.971E+00	8.990E+00
<b>C. V. =</b>		37.96%	7.30%	8.73%	11.13%	24.75%	16.69%	6.64%	16.33%	20.59%

## Treatment of Uncertainties

The following uncertain parameters associated with the X-slug inventory calculations described above have been identified and characterized:

- variability in the mass of uranium metal contained in an individual slug
- physical constants (fission yields, recoverable energy per fission, etc.)
- pile power
- pile power-to-peak-flux conversion factor
- relative flux values

### Variability in the mass of uranium metal contained in an individual slug

From 52-6-10, the original specifications for X-slugs (prior to the switch to the bonded alpha-slugs in the 1950's) was length =  $4.000 \pm 0.010$  inches and diameter =  $1.100 \pm 0.002$  inches [2]. These tolerances result in a maximum dispersion in the slug mass of  $\pm 0.6\%$ .

As an aside, note that the theoretical mass of uranium (theoretical density =  $19.05 \text{ g cm}^{-3}$ ) calculated for a cylindrical volume 1.1 inches in diameter and 4.0 inches long is 11.67 grams higher than the reference value for the mass of uranium in an X-slug (1175 grams). A mass of 1175 grams corresponds to a density of  $18.86 \text{ g cm}^{-3}$ .

### Physical constants:

The ORIGEN2.1 computer code used to perform the inventory calculations for Task 1 has seen decades of widespread use throughout the nuclear industry. It was used in the previously completed Hanford Environmental Dose Reconstruction (HEDR) effort to calculate quantities of  $^{131}\text{I}$  present in fuel dissolved at the Hanford reservation for the purpose of plutonium production. Formal calculations performed under the HEDR study to assess the uncertainties associated with using the ORIGEN2 code showed the maximum errors to be within  $\pm 5\%$  for the nuclides considered in the Task 1 source term [8]. Since the calculations performed under the HEDR study are nearly identical to those performed for the current effort, the  $\pm 5\%$  dispersion from the HEDR study should be equally applicable our own.

### Pile power:

In the case of calculations performed for Task 1, the pile power is used only as a proxy for computing the thermal flux. The absolute accuracy of the asserted power level is not of consequence. It is only important that the variability in the asserted power levels be addressed.

The pile staff recorded two values for the total pile power for each of the three shifts each day: the accumulated galvanometer power and the accumulated heat power. Since the galvanometer power was considered the reference value and was directly proportional to the neutron flux, this was the information used for all X-slug inventory calculations. Heat power, on the other hand, was prone to bias from the

variability in pile heat capacity with ambient temperature and from other sources. For this reason, the average of the heat power data over several days was used when calibrating the galvanometers [3].

The galvanometer reading was the net current that resulted from a pair of ion chambers located at one of the pile's shield walls. Both ion chambers were photon sensitive, but only one was neutron sensitive. The current output from the photon-only chamber was bucked against the current from the neutron-plus-photon chamber, with the resulting current being read out on an optical galvanometer in the pile control room [3,4].

Power for each shift was determined by dividing the accumulated power recorded in the pile operations logbooks for each shift (in kWh) by the nominal duration of each shift (eight hours). Accumulated power for each shift was determined by the pile operators from the accumulated kWh meter in the control room. It is assumed for the purpose of calculating the average pile power level for each shift that the accumulated power readings recorded in the logbooks correspond to changeover for each shift and thus correspond to a time interval of exactly 8.0 hours. However, as it is doubtful this was actually the case, an uncertainty exists in the shift power data that results from the difference between the actual time interval that each accumulated power reading corresponds to and the assumed interval (8.0 hours). This uncertainty was judged to be at most fifteen minutes, which corresponds to a dispersion of  $\pm 3\%$  about an 8.0 hour interval.

In addition to the uncertainty in the shift power data from the actual versus assumed time interval, any variability in the performance of the galvanometer circuit would also contribute to the uncertainty in the asserted shift power values. However, it is believed the galvanometer circuit would have given very consistent results on a day-to-day basis. The ion chamber bias was supplied by dry-cell batteries and thus would have been quite stable. In addition, the response of ion chambers is not sensitive to small changes in bias voltage, unlike other types of counters. Further, the galvanometer power was calibrated against the heat power at least monthly [3], hence drift would likely have not been an issue. In light of these facts, it was decided that extending the uncertainty assigned to the shift power data to account for additional uncertainty contributed by variability in the galvanometer circuit was not necessary. Hence, the uncertainty assigned to the shift power data should be left at  $\pm 3\%$ .

#### Pile power-to-peak-flux conversion factor:

The power-to-peak-flux conversion factor used in the final inventory calculations for X-slugs was  $3.102 \times 10^5$  neutrons  $\text{cm}^{-2}$   $\text{second}^{-1}$   $\text{watt}^{-1}$ . This value was derived by multiplying the value for this factor given in CP 2602 [5] ( $3.234 \times 10^5$ ) by the ratio of the fuel-to-air flux factor determined using MCNP (0.633) to that determined using the original power-to-peak-flux factor in conjunction with the relative flux equation (0.66). There are two inherent assumptions here: 1) that the difference in the two assessments of the fuel-to-air flux factor is due solely to bias in the power-to-peak-flux factor and not any bias in the relative flux expression; and 2) that the MCNP result is absolutely correct. The assumption that the difference in the flux ratios is due to bias in the power-to-flux factor is supported by MCNP calculations that show excellent agreement with values computed using the relative flux expression. The assumption that the MCNP result is accurate is one of convenience, as the uncertainties associated with this result

are judged to be minimal and hence the effort required to address these would not be warranted given they would have no appreciable impact on the overall results. The precision of the MCNP result was  $\pm 1.3\%$ , confirming it was statistically reliable.

The power-to-peak-flux factor determined by the X-10 pile physicists in 1945 was computed by multiplying the so-called  $\phi$ -value, which is the conversion factor between the total pile power and the neutron density at the pile center, by the neutron speed at thermal equilibrium ( $2.2 \times 10^5$  cm second<sup>-1</sup>). Dimensions of the  $\phi$ -value are neutrons cm<sup>-3</sup> watt<sup>-1</sup>. The  $\phi$ -value was determined by physical measurements using the so-called “standard graphite pile”, which was a graphite matrix into which a neutron source could be installed. Though specific details are not available, it is presumed a neutron source having a known emission rate was installed in the standard pile. The reference galvanometer (for measuring pile thermal power) was then used to correlate the neutron density at the pile center to thermal power with the results scaled up based on the relative size of the standard pile with respect to the Clinton pile. Hence, the measurement of the  $\phi$ -value depends on the uncertainty in the neutron emission rate of the reference source used and on the uncertainty in the calibration of the reference galvanometer against thermal power. The  $\phi$ -value determined by the pile physicists in February of 1945 was 1.47 neutrons cm<sup>-3</sup> watt<sup>-1</sup> [5]. Multiplying this value by the thermal neutron speed gives the power-to-peak-flux factor  $3.234 \times 10^5$  neutrons cm<sup>-2</sup> second<sup>-1</sup> watt<sup>-1</sup>.

Subsequent measurements of the  $\phi$ -value conducted after February of 1945 resulted in a revised reference value of 1.45 neutrons cm<sup>-3</sup> watt<sup>-1</sup> being given in 1947 [6]. This value is 1.4% lower than the original value determined in early 1945. More recently, researchers at Los Alamos used MCNP to assess response functions for LANL’s standard pile, which was built in the early 1950’s. The LANL pile had a different use than X-10’s in that it served as a reference geometry for the absolute calibration of neutron sources. However, the results for this assessment are still useful in that they show the assumption used by the X-10 physicists in the mid-1940’s that the neutrons emitted from the X-10 standard pile were completely thermalized appears valid. The LANL study showed the response functions for the Los Alamos pile to be relatively flat with respect to energy and that detection efficiencies for a BF<sub>3</sub> neutron detector located at the center of the pile varied by only 5% over a range of neutron energies [7].

The results from the MCNP calculations performed for the Los Alamos pile are consistent with the 4% bias that exists between the results from the MCNP calculations performed for the Clinton pile and the physical measurements performed by the Clinton pile physicists in 1945. The 4% bias is therefore seen to be reasonable. However, this does not address the issue of the uncertainty (dispersion) in the value of the power-to-peak-flux conversion factor used in the final X-slug inventory calculations. The precision of the MCNP calculation performed to yield the fuel-to-air flux ratio for the Clinton Pile was  $\pm 1.3\%$ . Thus, the overall uncertainty in this result is the precision plus any bias between the MCNP model and the actual system. An example of a source of bias would be impurities in the graphite or fuel slugs that were neglected in the MCNP model (though the levels of impurities in the Clinton pile had to be kept to an absolute minimum to be able to achieve a self-sustaining chain reaction). Whatever sources of bias may exist between the MCNP model and the actual system, there is no way to quantitatively account for them short of performing physical benchmarking experiments with actual

material from the Clinton pile. Hence, a subjective judgment is required to quantitatively address the uncertainty in the power-to-peak-flux conversion factor. Given the precision of the MCNP calculations, the power-to-peak-flux factor was assigned an uncertainty of  $\pm 5\%$ .

Relative flux values:

The relative flux distribution in the pile was characterized by running 0.020 inch diameter silver wires through eleven of the piles experimental holes, irradiating them for the same effective exposure time, allowing them to decay for two weeks and then counting them on an end-window GM counter [5]. The wires were cut into one inch segments at eight inch intervals and weighed before counting. Count results were normalized to the mass of each sample. Corrections were also made for counter dead-time and geometry. The relative flux distribution in the pile was determined by simply taking the ratio of the counting results from the wire segments as a function of position. No absolute quantification of flux was required. Thus, the uncertainty in the relative flux data is that associated with the counting of the individual wire segments. The components of this uncertainty are: counting statistics, reproducibility of geometry, dead-time corrections, and sample mass. There is no way to quantitatively address each of these components individually. However, there is information with which an assessment can be made of the overall uncertainty in the counting data.

CP 2602 speaks of a 5% ripple seen in the silver wire measurements corresponding to where the wire passed over the fuel channels [5]. Thus, it is reasonable to assume that the observed variability in their counting results was less than 5% and hence the overall error associated with the counting of the activated silver segments would have been within this range ( $\pm 5\%$ ).

Summary of uncertain parameters:

The uncertain parameters described above are summarized in Table 1 below. I think the best way to apply these to the inventory calculation results is to treat each as a normal distribution having a mean of unity and a standard deviation equal to the dispersion assigned in Table 1.

**Table 1 Summary of uncertain parameters identified for the calculation of discharge inventories for X-slugs used for RaLa production**

Parameter	Assigned Dispersion
Slug mass	$\pm 0.6\%$
Physical constants	$\pm 5\%$
pile power	$\pm 3\%$
power-to-peak-flux conversion factor	$\pm 5\%$
relative flux values	$\pm 5\%$

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## APPENDIX 3J

May 8, 1996

TO: Tom Widner  
ChemRisk

FROM: R. E. Burns, Jr.  
Shonka Research Associates, Inc.

SUBJECT: Characterization of uncertainties associated with the calculation of discharge  $^{131}\text{I}$  inventories for X-slugs pushed for RaLa production

MEMO NO: REB.004 C96

FINAL [X] DRAFT [ ]

Distribution:

Project File - SRA  
Joe Shonka - SRA

References:

1. Jones, H.; Watson, L. B.; Arnette, T.; Coveyou, I. "Neutron Distribution in the Clinton Pile" CP 2602, Oak Ridge National Laboratory, Oak Ridge, TN, February 27, 1945.
2. "Evaluation of an Expression for Computing the Relative Thermal Neutron Flux in Clinton Pile Fuel Channels Used for RaLa Production" SRA-95-003, Rev. 0 Shonka Research Associates, Inc. August, 1995.
3. Heeb, C. M. "Uncertainties in Source Term Calculations Generated by the ORIGEN2 Computer Code for Hanford Production Reactors" PNL-7223 HEDR, Battelle/Pacific Northwest Laboratories, Richland, WA March, 1991.

Memo:

Calculation of the  $^{131}\text{I}$  inventory contained in X-slugs pushed from the Clinton Pile for RaLa production will be accomplished in three basic steps:

1. Calculate the peak slug inventories for each channel pushed,
2. Establish the slug position factor for each individual slug in a set, and

3. Calculate the inventory distribution for each slug pushed from a given channel and then sum these distributions to establish distributions for  $^{131}\text{I}$  inventory for the entire channel and for the entire push

Each of these steps is discussed below, followed by identification of the uncertain parameters associated with each step and the means that will be used to characterize each parameter so the contribution of each to the overall uncertainty can be assessed. The overall approach to establishing distributions for the  $^{131}\text{I}$  inventory at discharge for X-slugs pushed from the Clinton Pile for RaLa will be to embed the methodology described above in a spreadsheet model and use the Crystal Ball<sup>®</sup> add-in package to propagate uncertainties. The result will be frequency distributions for each RaLa push that represent the total  $^{131}\text{I}$  inventory that was available for dissolving at the time the slugs were pushed.

### **Step 1: Calculate the peak slug inventories for each channel pushed.**

The peak slug inventory (PSI) for a given set of slugs is the  $^{131}\text{I}$  inventory calculated (using the ORIGEN2.1 code) for an arbitrary slug located at the center of the Clinton Pile having the same irradiation history as the slugs of interest. Note that not all of the slugs pushed at a specific time from a given fuel channel had the same irradiation history. Channels were often loaded incrementally in the earlier years of RaLa production at X-10, i.e., not all of the slugs in a channel were loaded at the same time. Thus, all of the slugs making up the total pushed from a specific channel could have made up of individual sets of slugs having the same irradiation history, i.e., the same charge and discharge dates. PSI's are therefore calculated for each set of slugs within a specific channel pushed at a specific time. Multi-set channels were common through RaLa Run 18 (June, 1947).

As said, PSI's are calculated using the ORIGEN2.1 code. The code is set up to calculate the nuclide inventory contained in a single X-slug (1175 grams of natural uranium) based on the irradiation history for the set of slugs of interest. The irradiation history for each set of slugs is derived from the push data for each RaLa discharge, which establishes the charge and discharge dates, and the pile operating logs, which establish the actual shift when the slugs were charged and discharged. The slug irradiation history is established down to the shift level as this is the precision to which we know the pile's power history. We have retrieved the shift power history for the Clinton Pile for the entire period of interest. Thus, the power history for each set of slugs is known to the nearest eight hours over their entire irradiation period. The pile power data for each shift is converted, using the expression from CP 2602 [1], to a peak thermal flux value. This value is then multiplied by 3.16 to convert it to total flux [2]. Thus, the ORIGEN2.1 code is run for a single X-slug located at the point of maximum pile flux over the period of time corresponding to that for the set of slugs of interest. The resulting  $^{131}\text{I}$  inventory calculated is then the PSI for the set of slugs of interest. Once the PSI for a set of slugs has been calculated, the actual inventories for each slug in the set are computed based on the position of the slugs within the pile relative to the pile center.

**Step 2: Establish the slug position factor for each individual slug in a set.**

The slug position factor represents the relative value of the pile flux at the position of interest to the peak flux at the pile center. Position factors are determined using the expression given in CP 2602 for this purpose and assuming that the slugs were loaded so that they were centered in the channel in the axial direction. Multiplying the position factor value for an individual slug by the PSI for its set gives the uncorrected inventory for that slug. (Uncorrected inventory refers to the fact that this value needs to be corrected for the fact that the expression used to calculate the position factors was developed for the purpose of calculating the flux in the pile experimental holes and therefore overestimates the flux in the fuel regions [2]). For channels with more than one set of slugs, position factors will have to be chosen carefully so as to accurately reflect the position of the slugs within the channel. This is particularly true for Runs 1 and 2, as not all of the slugs in a channel were pushed for these runs.

Note that treating the slugs as being “load-centered” (entire charge of slugs is centered in the channel) or “slug-centered” (middle slug in a charge is located at the center of the channel) makes no appreciable difference in the value of the slug position factors. For a 36 slug charge, the difference in the position factor between the two assumptions for the slug on the east end is less than 4% (3.6%) These differences for individual slugs decrease as one approaches the center of the channel. In terms of the effect on the total inventory for a channel, the differences in the position factors between the two assumptions are negligible. As shown in SRA-95-003 [2], treating the slugs as load-centered or slug-centered makes no difference when the contributions from all slugs are considered together.

**Step 3: Calculate the inventory distribution for each slug pushed from a given channel.**

Each slug in a channel will have its own position factor. Hence, the inventory for each slug is assessed by multiplying the position factor distribution by the appropriate PSI distribution for the set from which each slug came. This product is then multiplied by the power factor used to correct for the overestimation of the pile flux by the relative flux expression (taken from [2]). The result will be a distribution of possible <sup>131</sup>I inventories for each slug in a channel that can then be summed to yield the distribution for the channel as a whole. These channel distributions can then also be summed to yield the distribution for an entire push. (In actuality, all of this summing of distributions will have to be done simultaneously, as the distributions are established through Monte Carlo sampling).

**Uncertain parameters associated with calculation of the PSI for each set of slugs:**

The uncertain parameters associated with the calculation of the peak slug inventory (PSI) are as follows:

- mass of uranium metal in an X-slug
- <sup>235</sup>U content per unit mass of uranium metal in each slug
- total pile power (i.e., change in peak flux over time)
- total pile power to peak flux conversion factor

- change in flux over the length of the slug
- ORIGEN cross-sections and half-lives

Of the parameters listed above, the only ones likely to be of any consequence will be the uncertainties associated with the total pile power and the power to peak flux conversion factor. Uncertainties in the total pile power will likely have to be established on a subjective basis, as it is doubtful that any analysis of this nature was ever done by the pile staff. The uncertainty associated with the power to flux conversion will be established by developing a computer model of the Clinton Pile using a code such as MCNP 4A.

The uncertainty associated with variances in the mass of uranium contained in X-slugs will have to be established from historical records from X-10. At Hanford, there were strict requirements on slug quality implemented in the operational practices for the 300 area. Since X-10 did not produce their own slugs, responsibility for slug quality rested with the vendor (ALCOA). I would presume that X-10 did provide ALCOA with acceptance criteria for slugs, but I do not recall coming across anything like this in our records to date. Thus, additional records searches will need to be conducted for the purpose of establishing the bounds on the mass of metal used in Clinton Pile slugs.

The uncertainty in the  $^{235}\text{U}$  content per unit mass of uranium metal in each slug is of no appreciable consequence for our purpose and will be neglected. Since the slugs used for RaLa were irradiated to such low burnup, the  $^{235}\text{U}$  content of the fuel is inconsequential since almost all the power is coming from the  $^{235}\text{U}$  and very little from ingrowth of  $^{239}\text{Pu}$ . (In cases where fuel is irradiated to higher burnups, the contribution to the total power from  $^{239}\text{Pu}$  becomes substantial). Thus, there is no significant change in the fission yield over time and therefore no need to account for variability in  $^{235}\text{U}$  content. To demonstrate this, three runs were made using the ORIGEN2.1 code to irradiate 1175 grams of uranium having enrichments of 0.3 %, natural (0.71%) and 3%  $^{235}\text{U}$ . In each case, the uranium was irradiated for 100 days at a power of 400 watts. The resulting  $^{131}\text{I}$  inventories at the end of the 100 days were 9.854 Ci for the 0.3% enriched fuel, 9.654 Ci for the natural uranium and 9.554 Ci for the 3% enriched metal. As is seen, the difference between the 0.3% case and the 3% case is 3%. As any credible assessment of the variability in the  $^{235}\text{U}$  content of the uranium metal used in the X-slugs would be on the order of parts per million, it is clear that the variability in the  $^{235}\text{U}$  abundance in the X-slug metal can be neglected. For the record, the reason for the difference in the  $^{131}\text{I}$  produced in the three test cases is the amount of  $^{239}\text{Pu}$  produced in each case during the 100 day irradiation. Even with these very low burnups, there is 86 mg of  $^{239}\text{Pu}$  produced in the slug with the depleted metal (0.3% enriched) and only 9 mg produced in the enriched case (3%). The  $^{131}\text{I}$  fission yield from  $^{239}\text{Pu}$  fission is three times that of  $^{235}\text{U}$ , thus a relatively small quantity of  $^{239}\text{Pu}$  present in the slug can have a significant impact on the quantity of  $^{131}\text{I}$  produced. Note that our method of using the actual slug power histories for calculating X-slug inventories fully accounts for this effect and thus eliminates it as a source of uncertainty.

For the purposes of calculating the  $^{131}\text{I}$  content of individual slugs in a Clinton Pile channel, the slug position factor used has been the value that corresponds to the geometric center of the slug, and this value has been used to compute the inventory for the slug's total volume. Thus, the value for the center of the slug is treated as an average value that is applied over the slug's entire length. To assess the

magnitude of any uncertainty resulting from this practice, one need only look at the change in the calculated values of the slug position factor over the length of a slug (four inches) at positions where the flux gradient in the axial direction would be the greatest, i.e., the ends of the channels. If the difference between the position factors at one of the slug and the other are not symmetric about the value at the center, then applying the center value over the entire length will introduce an uncertainty that would need to be addressed. If the values are symmetric, however, then no such uncertainty exists. To establish if the position factor values were symmetric over the length of an X-slug for axial positions of interest in the Task 1 effort, the position factors were calculated for locations corresponding to the middle and two ends of a slug located at the east and west end of pile channel 1868 containing a total of 36 slugs. For the east slug, the position factor values for the two ends were 0.529 and 0.566, and the value for the center was 0.548. Likewise, the values for the two ends of the west slug were 0.528 and 0.490, with a center value of 0.509. In both cases, the average of the values for the two ends equals the value for the center. Thus, it is determined that there is no appreciable uncertainty contributed from the practice of treating the position factor value corresponding to the center of a slug as an average for the total slug volume. (There is no need to perform calculations for other channel, as the axial distribution of the flux does not change with channel location, i.e., radial position).

Using the ORIGEN2.1 computer code to assess the quantities of  $^{131}\text{I}$  contained in slugs discharged for RaLa processing introduces some minor uncertainties to the calculated values. These uncertainties stem from uncertainties in the various constants and conversion factors used by the code to calculate isotope production and depletion. These factors include reaction cross-sections, fission product yields, recoverable heat energy per unit fission, decay constants, etc. Of these, the largest contributors to uncertainty are the values for the spectrum averaged reaction cross-sections used by the code to compute fission, activation, etc. These values are specific to the neutron energy distribution in the reactor system of interest and therefore vary with the reactor type being considered. However, the importance of these differences with respect to the accuracy of results calculated by the ORIGEN code depends on the specific nuclides of interest. In the case of  $^{131}\text{I}$ , production is directly proportional to the number of fissions that have occurred, since this nuclide is a fission product and does not have a significant activation cross-section in comparison with its half-life. Thus, differences in the reaction cross-sections for  $^{131}\text{I}$  for different reactor models are largely insignificant (as long as the fuel makeup stays the same), since  $^{131}\text{I}$  production depends for the most part on reactor power and not the neutron energy spectrum. The neutron energy spectrum can be of consequence in the case of higher burnups, as the spectrum has an effect on plutonium ingrowth, which can substantially impact  $^{131}\text{I}$  production (as discussed above). However, this situation is of minor concern with respect to ORIGEN calculations for Task 1, as the burnups of interest are small. The impact of the choice of the cross-section and fission product yield library on the quantities of  $^{131}\text{I}$  calculated by the ORIGEN2.1 code for a natural uranium fuel for two different burnups is illustrated in Table 1.

**Table 1  $^{131}\text{I}$  content for one X-slug calculated by ORIGEN2.1 using two different cross-section and fission product yield libraries**

Reactor Model	$^{131}\text{I}$ Content at 100 days	$^{131}\text{I}$ Content at 1000 days
CANDUNAU	9.654 Ci	9.849 Ci
PWRUS	10.21 Ci	10.57 Ci

The table shows the calculated  $^{131}\text{I}$  inventory contained in 1175 grams of natural uranium (one X-slug) irradiated for 100 days and for 1000 days using two different cross-section and fission product yield libraries: the CANDUNAU library for CANDU reactors using natural uranium fuel and the PWRUS library for a three-cycle PWR using 3.2% enriched fuel at a standard burnup of 33,000 MWd/MTHM. The neutron energy spectrum for the Clinton Pile would lie somewhere in between the spectra for the two cases considered (CANDU and PWR). As is seen, the inventories calculated using the PWR library are greater than those for the same irradiation using the CANDU data. The reason for this is that the harder spectrum found in the PWR results in higher production of  $^{239}\text{Pu}$ , thus resulting in more production of  $^{131}\text{I}$ . The difference is 5.7% at 100 days and 7.3% at 1000 days.

For the Hanford dose reconstruction study, Cal Heeb performed a similar comparison between the CANDU library and a library that had been developed for the Hanford N reactor to assess the magnitude of the uncertainty from using the N reactor library to perform calculations for the other Hanford piles (which were more heavily moderated than the N reactor and thus more thermal) [3]. Heeb found the average difference between the  $^{131}\text{I}$  content calculated using the CANDU and N reactor libraries was 3.6% for burnups between 100 and 1000 MWD/Ton (i.e., N reactor inventories were higher) [3]. Given this, Heeb concluded that the uncertainty contributed by the ORIGEN code to calculations for  $^{131}\text{I}$  was negligible in comparison with uncertainties in release fractions and atmospheric transport [3]. Given that the neutron energy spectrum for the Clinton Pile had to be very similar to that for the Hanford piles and that the fuel burnups we are concerned with for RaLa are much smaller than those experienced at Hanford, I think it is safe to draw the same conclusion that any uncertainty contributed to the  $^{131}\text{I}$  inventory calculations for X-slugs from the ORIGEN2.1 code can be neglected for the purpose of this study.

Note that the conclusion that uncertainties contributed by the ORIGEN2.1 code to the overall uncertainty in the discharge inventory calculations can be neglected is not based solely on comparisons of ORIGEN results with each other. The ORIGEN code is widely used in the nuclear industry and has been extensively benchmarked against physical measurements made with irradiated reactor fuel. Heeb discusses such comparisons in section 2 of PNL-7223 HEDR [3].

### **Uncertain parameters associated with the position factor for each slug in a set:**

The uncertain parameters associated with establishing the slug position factor for each slug in a set are as follows.

- uncertainty in the relative flux equation
- uncertainty from assuming slugs spent their entire irradiation duration in their final position (not applicable for channels with only one set)

Uncertainty in the relative flux equation will be assessed using the same analysis used to establish the uncertainty in the power to peak flux conversion factor. However, one should recognize that the flux equation is being applied on a relative basis and thus the associated uncertainty should be small.

The uncertainty associated with treating slugs as if they spent their entire irradiation cycle in one position (their final position) was assessed by using the ORIGEN2.1 code to calculate the difference between the <sup>131</sup>I inventories calculated for slugs using their actual power histories (i.e., accounting for slug movement) and inventories calculated for the same time duration, but at the power level corresponding to that at the slug’s final position. Calculations were performed for the eastmost and westmost slugs of the initial charge for several RaLa discharges thought to represent worst case histories. A total of nine cases were considered. In seven of these, the initial charge was only moved once (slugs had two positions). In one case, the slugs were moved twice and in another they were moved three times. The results from these experiments are shown in Table 2. The values in the “Error” columns are the differences between the inventory calculated with the slug irradiated in its final position only and the inventory calculated accounting for the time the slug spent in each position it was moved to during irradiation for the slugs on the two ends of the initial charge.

**Table 2 Errors resulting from the assumption that X-slugs did not move during their irradiation cycle for selected cases**

Run Number	Channel	Error (assumed position vs. actual)	
		East Slug	West Slug
2	1566	0.0%	-0.3%
3	1766	0.0%	-1.2%
3	2269	0.1%	-1.1%
4	1665	0.0%	-0.3%
4	1766	-0.3%	-3.6%
4	2065	-0.1%	-0.4%
5	1669	-0.1%	-0.6%
8	1672	0.1%	-0.7%
9	1767	-1.2%	-1.4%
<b>Average</b>		<b>-0.2%</b>	<b>-1.1%</b>

As is seen, the impact is trivial for the slug on the east end of the charge. In general, the east slug experiences only a minor change in relative power level when it is moved by the charging of additional slugs to the same channel since the change in power level per unit change in axial position decreases as the slug moves from east to west. It would be rare for the charging of new slugs to result in the east slug being moved to a position of lower power than where it was before. This would only happen if there were only a few slugs in the initial charge, which was the case for channel 1767 pushed for RaLa Run 9. As seen, the error for the east slug in this case is significantly higher than for the other cases (although still quite small as a whole).

The error values for the west slugs are higher than those for the east slugs since the west slug is always moving from higher to lower power as new slugs are added. However, even in the case of the west slugs, the effect of assuming the slug did not move is quite small, with an average error of -1.1% and a maximum of -3.6% for the cases considered. Thus, in consideration of the data in Table 2, uncertainty from the practice of treating X-slugs as if they spent their entire irradiation cycle in their final position will be neglected.

## **Summary of Uncertain Parameters**

From the above discussions, it follows that there are only three of the uncertain parameters identified as associated with calculation of the  $^{131}\text{I}$  inventory at discharge for X-slugs pushed for RaLa that need to be considered in such calculations. These are

- the mass of uranium metal in each slug,
- the pile power to peak flux conversion factor, and
- the slug position factors (relative flux values).

The bounds for the mass of uranium metal contained in X-slugs will have to be established from the available historical literature. We intend to use the appropriate modules from the SCALE4.3 code package to address the uncertainties for the power to flux conversion and the relative flux as a function of position.

### **Spreadsheet model:**

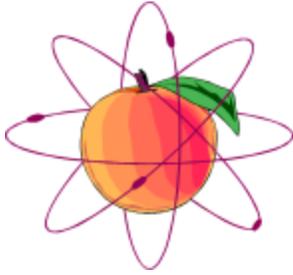
Once evaluations for all of the relevant uncertain parameters identified above have been completed, the distributions established for each parameter will be incorporated into a spreadsheet model that will, utilizing the Crystal Ball<sup>®</sup> add in package for Excel<sup>™</sup>, allow us to establish frequency distributions for the following:

- $^{131}\text{I}$  inventory for individual slugs at discharge,
- $^{131}\text{I}$  inventory for each channel at discharge, and
- $^{131}\text{I}$  inventory for an entire push.

Analyses will be performed for each push that was made for each RaLa run, with a push defined as a group of channels discharged at one time for the purpose of obtaining slugs for RaLa. Inventory calculations will be performed for each individual slug in each channel discharged for a specific push, with the distributions for each slug summed to yield the distribution for the channel. The inventory distributions for each channel would then be summed to get the distribution for the push as a whole. An example of what the spreadsheets for the calculation of the channel inventories should look like is presented in Fig. 1. The spreadsheet shows the calculation of the individual slug and channel discharge inventory for channel 1967 pushed for RaLa Run 1. The PSI and power factor are accurate, however, the position factors are not, as the 30 slugs pushed from this channel were not all of the slugs available, i.e., only the westmost 30 slugs were pushed. The uncertain parameters have been set to 1.0, as it is anticipated that these will be treated as distributions about unity once they have been characterized. In reality, the values under the “ $^{131}\text{I}$  Inventory” column would be forecast cells, with the inventory values for each slug being frequency distributions for the  $^{131}\text{I}$  inventory based on the distributions defined for the uncertain parameters. The “Sum” cell would be an aggregate distribution made up of the individual values determined for the distributions for the inventories for each slug. There would be one additional forecast cell that is not shown, that being the sum of all of the sum distributions for each channel that would be the distribution for the entire push. The push distribution is what would then be used as input to the plant model, i.e., whatever means we decide to use to go from discharge inventory to releases.

**Figure 1 Example spreadsheet for the calculation of channel inventories, including propagation of uncertainties**

<b><sup>131</sup>I Inventory Calculations for RaLa Run 1</b>									
<b>Channel</b>	<b>Slug</b>	<b>PSI</b>	<b>Position Factor</b>	<b>Power Factor</b>	<b>Uncertainty Distributions</b>				<b><sup>131</sup>I Inventory</b>
					<b>Slug Mass</b>	<b>Pile Power</b>	<b>Power to Flux Factor</b>	<b>Relative Flux</b>	
1967	-15	10.72	0.641	0.66	1.0	1.0	1.0	1.0	4.5
1967	-14	10.72	0.671	0.66	1.0	1.0	1.0	1.0	4.7
1967	-13	10.72	0.699	0.66	1.0	1.0	1.0	1.0	4.9
1967	-12	10.72	0.725	0.66	1.0	1.0	1.0	1.0	5.1
1967	-11	10.72	0.749	0.66	1.0	1.0	1.0	1.0	5.3
1967	-10	10.72	0.771	0.66	1.0	1.0	1.0	1.0	5.5
1967	-9	10.72	0.791	0.66	1.0	1.0	1.0	1.0	5.6
1967	-8	10.72	0.809	0.66	1.0	1.0	1.0	1.0	5.7
1967	-7	10.72	0.824	0.66	1.0	1.0	1.0	1.0	5.8
1967	-6	10.72	0.838	0.66	1.0	1.0	1.0	1.0	5.9
1967	-5	10.72	0.848	0.66	1.0	1.0	1.0	1.0	6.0
1967	-4	10.72	0.857	0.66	1.0	1.0	1.0	1.0	6.1
1967	-3	10.72	0.863	0.66	1.0	1.0	1.0	1.0	6.1
1967	-2	10.72	0.866	0.66	1.0	1.0	1.0	1.0	6.1
1967	-1	10.72	0.867	0.66	1.0	1.0	1.0	1.0	6.1
1967	1	10.72	0.866	0.66	1.0	1.0	1.0	1.0	6.1
1967	2	10.72	0.863	0.66	1.0	1.0	1.0	1.0	6.1
1967	3	10.72	0.856	0.66	1.0	1.0	1.0	1.0	6.1
1967	4	10.72	0.848	0.66	1.0	1.0	1.0	1.0	6.0
1967	5	10.72	0.837	0.66	1.0	1.0	1.0	1.0	5.9
1967	6	10.72	0.824	0.66	1.0	1.0	1.0	1.0	5.8
1967	7	10.72	0.808	0.66	1.0	1.0	1.0	1.0	5.7
1967	8	10.72	0.791	0.66	1.0	1.0	1.0	1.0	5.6
1967	9	10.72	0.771	0.66	1.0	1.0	1.0	1.0	5.5
1967	10	10.72	0.749	0.66	1.0	1.0	1.0	1.0	5.3
1967	11	10.72	0.724	0.66	1.0	1.0	1.0	1.0	5.1
1967	12	10.72	0.698	0.66	1.0	1.0	1.0	1.0	4.9
1967	13	10.72	0.670	0.66	1.0	1.0	1.0	1.0	4.7
1967	14	10.72	0.640	0.66	1.0	1.0	1.0	1.0	4.5
1967	15	10.72	0.608	0.66	1.0	1.0	1.0	1.0	4.3
<b>Sum =</b>									<b>165.4 Ci</b>



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## APPENDIX 3K

May 19, 1997

TO: Tom Widner  
ChemRisk - Alameda

FROM: R. E. Burns, Jr.  
Shonka Research Associates, Inc.

SUBJECT: Inventory calculations for W-slug RaLa runs

MEMO NO: REB.010 C97

FINAL  DRAFT

Distribution:

References:

1. Heeb, C. M.; Bates, D. J. "Radionuclide Releases to the Columbia River from Hanford Operations, 1944-1971" PNWD-2223 HEDR, Battelle/Pacific Northwest Laboratories, Richland, WA January, 1994.
2. Barnard, M. G. "100 Areas Monthly Reports - 1949" Hanford 45828, Hanford Operations Division, 1949.
3. Jaech, J. L. "Monthly Summary of Dissolver Data" FTS-CLVI-73, undated.
4. Heeb, C. M. "Radionuclide Releases to the Atmosphere from Hanford Operations, 1944-1972" PNWD-2222 HEDR, Battelle/Pacific Northwest Laboratories, Richland, WA January, 1994.
5. REB.007 C97, "Slug factors for the Hanford production reactors", memo from R. E. Burns, Jr. to Tom Widner dated April 28, 1997.
6. REB.005 C97, "Tube factors for the Hanford production reactors", memo from R. E. Burns, Jr. to Tom Widner dated April 25, 1997.
7. REB.002 C97, "Final inventory values for X-slugs", memo from R. E. Burns, Jr. to Tom Widner dated April 30, 1997.

8. Heeb, C. M.; "Uncertainties in Source Term Calculations Generated by the ORIGEN2 Computer Code for Hanford Production Reactors" PNL-7223 HEDR, Pacific Northwest Laboratory, March, 1991.

Memo:

Inventory calculations have been completed for all RaLa runs in which W-slugs were used. These were Runs 28 through 68, with the exception of Run 43, which was a low-level break in run in which only X-slugs were used (approximately 60).

Inventories have been calculated for each run for  $^{131}\text{I}$ ,  $^{140}\text{Ba}$  and total iodine content at the time of reactor shutdown. The inventory values for  $^{131}\text{I}$  and  $^{140}\text{Ba}$  are given in terms of curies of activity per unit mass of uranium shipped (in kilograms). Total iodine values are given in terms of mass of total iodine (in grams) per unit mass of uranium. Again, these values are per unit mass of uranium shipped and not per mass of uranium pushed. The calculations account for the fact that only the center-most slugs were used from each tube pushed.

Inventories were calculated using the ORIGEN2.1 computer code with the CANDUNAU cross-section and fission product yield library. The calculations were carried out for continuous irradiation, with corrections for saturation applied afterwards. In cases where the irradiation time was not known, two ORIGEN calculations were performed to bound the possible inventory. The irradiation time used for the upper bound calculation was always 100 days. 100 days was chosen to guarantee saturation for all radio-iodines and for  $^{140}\text{Ba}$  without being excessively long. For the lower bound calculations, one of two different irradiation times was used depending on the year in which the run took place. Examination of the runs for which the irradiation time was known showed that for runs prior to 1951, a lower bound of 50 days seemed appropriate, whereas a lower bound of 14 days appeared correct for runs from 1951 on. Known irradiation times are given in Table 1. Different irradiation times for the same run number correspond to different groups of slugs in the same discharge (i.e., different charge dates).

Once the desired irradiation times were established, ORIGEN calculations were carried out for a mass of natural uranium equivalent to that in one tube. The tubes in the Hanford piles were charged with either 32 eight inch (W-8) slugs or 64 four inch (W-4) slugs. At 3.564 kg per W-8 slug, this is a total mass of 114.048 kg  $^{\text{nat}}\text{U}$ . The power levels used for each reactor were the average tube power for the appropriate time period, taken to the nearest month. The average tube power for each month was computed by dividing the average reactor power for the month of interest by the total number of tubes. All of the Hanford reactors used for RaLa contained 2004 tubes. The same average tube power was used for all days in a given month. The average reactor power for each month was taken from Appendix A of PNWD-2223 HEDR [1]. Note that for several of the W-slug runs, inventory calculations had to be carried out for more than one reactor since the reactor the slugs came from was unknown. In cases where there was overlap in the power levels for the possible reactors of origin, the inventory values reflect the average across all possible source reactors. However, there were cases where the reactor power levels did not overlap. In these cases, individual inventory distributions for the two reactors representing the most likely source and worst case source were established.

**Table 1 Known irradiation times for W-slug RaLa runs**

Run Number	Date	Irradiation Time (days)
28	November, 1948	87
31	March, 1949	69
31	March, 1949	46
38	January, 1950	98
40	March, 1950	99
41	April, 1950	90
42	June, 1950	50
51	September, 1953	302
53	July, 1953	40
55	January, 1954	63
55	January, 1954	29
57	July, 1954	33
58	October, 1954	21
59	March, 1955	14
68	October, 1956	43

In cases where the reactor of origin (source reactor) for the slugs pushed for a given run was established, this information was obtained from one of three sources. For several of the runs, the teletypes that were sent from Hanford to X-10 notifying them that shipment had been made were found. Some of these (but by no means all of them) stated the reactor from which the slugs had come from (along with additional irradiation data). For all of the runs that took place in 1949, Ref. [2] was used to establish the source reactor. A third document used to establish source reactor was Ref. [3], which was used in cases where both the charge and discharge dates for a set of slugs was known. In these cases, the dissolver summary data were reviewed to identify the reactor for which routine discharges that uniquely matched both the charge and discharge dates had occurred. If such a match could be made, then that reactor was considered to be the source for the RaLa slugs.

Following each ORIGEN run, the values for curies of  $^{131}\text{I}$  and  $^{140}\text{Ba}$  and for grams of total iodine were corrected for saturation. Saturation correction factors were computed on the basis that the Hanford piles maintained a 90% capacity factor. 90% capacity was the value established by Heeb during the HEDR study [4] and is consistent with what was observed during this current effort.

Saturation factors were computed for the three quantities of concern for the three values used for irradiation time (14, 50 and 100 days). The factors were determined using ORIGEN to calculate inventories for equivalent durations of continuous and discontinuous operation. For the 14 day period, the saturation fractions are based on a continuous operating interval of 13 days compared to a cycle of 6 days on, one day off and 6 days on. For the 50 and 100 day intervals, the comparisons are between 49 and 99 days of continuous operation and cycles of 9 days on and one day off repeated 5 and 10 times, respectively. The results from these assessments are given in Table 2.

**Table 2 Saturation factors for the three irradiation intervals used**

Species	Saturation Factor (ratio of discontinuous to continuous operation)		
	14 Days	50 Days	100 Days
<sup>131</sup> I	0.924	0.933	0.932
<sup>140</sup> Ba	0.925	0.926	0.923
total iodine	0.943	0.935	0.922

For runs where the actual irradiation time was known, the saturation factors used were those for the irradiation time from Table 2 closest to the actual duration.

After the ORIGEN results were corrected for saturation, they were then corrected so that the inventory reflected that contained only in the 38 center-most slugs (in the case of W-4 tubes) or 18 center-most slugs (in the case of W-8 tubes). The center 38 slugs in a tube of 64 W-4 slugs yield 74.9% of the tube's power and the center 18 slugs in a tube containing 32 W-8 slugs provide 71.8% of the power [5]. Thus, the inventories for a given tube are multiplied by either 0.749 or 0.718, depending on the slug type, to get the inventory contained in the slugs shipped to X-10 from that particular tube. Note that, at this point, the inventory values still represent the average for all tubes in the reactor - adjustments for radial power variation have yet to be made.

After the inventory results were corrected to give that contained only in the slugs shipped, tube factors were established to adjust the inventory to reflect the actual rather than the average tube power. In cases where the tube factor for a given discharge was known, the value was simply multiplied by the average inventory value. If the tube factor was not known, an appropriate Beta distribution was established from which tube factor values could be sampled. A detailed discussion of tube factors and how they are sampled for Task 1 calculations is given in REB.005 C97 [6].

After tube factors were established for each reactor of concern for a given RaLa run, how the inventory calculation was completed depended upon what information was available. The inventory calculations can be broken up into seven different cases:

1. runs where the reactor of origin, irradiation time and tube factor are all known;
2. runs where the reactor of origin is known, but tube factor and irradiation time are not;
3. runs where reactor of origin and tube factor are known, but irradiation time is not;
4. runs where reactor of origin, tube factor and irradiation time are all unknown, but power levels among the possible source reactors overlap;
5. runs where reactor of origin and irradiation time are known, but tube factor is not;
6. runs where reactor of origin, tube factor and irradiation time are all unknown, and power levels among the possible source reactors do not overlap; and
7. runs where irradiation time is known, but source reactor and tube factors are unknown and reactor power levels do not overlap.

The breakdown of the W-slug runs with respect to the seven categories above is as follows:

Category 1: Runs 28 through 31 and 40 through 42;

Category 2: Runs 32 through 37;

Category 3: Run 38

Category 4: Runs 39 and 44 through 50;

Category 5: Runs 51, 53, 55, 57, 59 and 68;

Category 6: Runs 52, 54, 56 and 60 through 67; and

Category 7: Run 58.

For the runs in Category 1, no sampling of any kind is required, and the result is simply the product of the corrected ORIGEN data and the tube factor divided by the mass of 38 W-4 slugs. (No runs in this category involved W-8 slugs.)

For the runs in Category 2, Monte Carlo sampling is performed on tube factor and the corrected ORIGEN results for the upper and lower bounds for irradiation time. Tube factor is sampled as a Beta distribution and the ORIGEN data are sampled uniformly between the lower and upper bounds. For all runs in Category 2, the lower bound for irradiation time is 50 days, as all of these runs took place prior to 1951.

For the runs in Category 3, only the ORIGEN results for the upper and lower bounds for irradiation time are sampled. This gives a trivial result of a uniform distribution bounded between the product of the lower and upper ORIGEN results and the tube factor (divided by the appropriate mass).

For the runs in Category 4, the calculation is the same as those in Category 2 for each individual reactor, but the individual results are averaged to establish uniform sampling across the possible reactors of origin as well.

For runs in Category 5, sampling is performed only on the tube factor.

Like Category 4, the runs in Category 6 are addressed through sampling the tube factor and average tube inventory. However, since the power levels for the possible piles of origin do not overlap, a single distribution representing the possible inventory values cannot be established. Thus, individual distributions for the most likely and worst case source reactors were established instead. For all runs in Category 6, the most likely source was deemed the H reactor and the worst case (highest power) was the C reactor.

The inventory calculation for the run in Category 7 was completed through sampling the tube factor distribution for the most likely and worst case source reactors (H and C, respectively).

In all of the inventory calculations described above except for those in Category 1, uncertainty in the results is reflected in the frequency distributions that are generated in each calculation. However, there are some additional sources of uncertainty in these calculations that should be mentioned. The results from the ORIGEN computer code have a small uncertainty due to uncertainty in the reaction cross-section and fission product yield values. There is also uncertainty associated with the correction of the ORIGEN results for actual reactor operation (saturation). A value of  $\pm 5\%$  was recommended previously to address the uncertainty associated with the use of the ORIGEN code and other physical constants in the inventory calculations completed for the X-slug RaLa runs [7]. This value represented a maximum uncertainty for the nuclides of interest in this current effort, and was based on an assessment performed by Heeb during the Hanford study [8]. Given that the  $\pm 5\%$  dispersion is a maximum value and that there is little variability seen in the saturation factors computed for the W-slug calculations, an uncertainty of  $\pm 5\%$  is recommended to account for the combined uncertainties from physical constants and reactor power variation.

An additional source of uncertainty in the W-slug calculations is that associated with reactor power and asserted tube factors. In the Hanford study, Heeb used a value of 5% for the uncertainty in the recorded pile power levels [1]. This is likely an overstatement given that pile power was recorded to much greater precision, hence an uncertainty of  $\pm 5\%$  should be adequate for the combined uncertainties in pile power and asserted tube factors.

To give an idea of the magnitude of the potential releases of  $^{131}\text{I}$  from RaLa processing at X-10, the mean values from the most likely distributions for each W-slug RaLa run were used to generate the data in Fig. 1. Totals are given for the time of reactor shutdown prior to discharge and for six days of decay time, where decay time is defined as the time between reactor shutdown and the start of the first dissolving. As seen, the most likely total for all of the runs at six days of decay is 638,498 Ci of  $^{131}\text{I}$ .

**Figure 1 Total <sup>131</sup>I inventories for each W-slug RaLa run based on most likely results**

Run No.	W-8	W-4	Total	Total	Mean <sup>131</sup> I at	Total <sup>131</sup> I at	Total <sup>131</sup> I at			
	Slugs Charged	Slugs Charged	Mass (kg) W-8	Mass (kg) W-4	shutdown W-8 (Ci/kg)	6 days W-8 (Ci/kg)	discharge W-4 (Ci/kg)	6 days W-4 (Ci/kg)	shutdown (Ci)	6 days (Ci)
28	0	36	0.000	64.152	0.000E+00	0.000E+00	5.288E+01	3.152E+01	3.392E+03	2.022E+03
29	0	38	0.000	67.716	0.000E+00	0.000E+00	5.180E+01	3.088E+01	3.508E+03	2.091E+03
30	0	38	0.000	67.716	0.000E+00	0.000E+00	4.937E+01	2.943E+01	3.343E+03	1.993E+03
31	0	76	0.000	135.432	0.000E+00	0.000E+00	5.251E+01	3.130E+01	7.112E+03	4.239E+03
32	0	76	0.000	135.432	0.000E+00	0.000E+00	4.687E+01	2.794E+01	6.348E+03	3.784E+03
33	0	76	0.000	135.432	0.000E+00	0.000E+00	4.889E+01	2.914E+01	6.621E+03	3.947E+03
34	0	76	0.000	135.432	0.000E+00	0.000E+00	5.114E+01	3.048E+01	6.925E+03	4.128E+03
35	0	74	0.000	131.868	0.000E+00	0.000E+00	4.640E+01	2.766E+01	6.118E+03	3.647E+03
36	0	74	0.000	131.868	0.000E+00	0.000E+00	4.643E+01	2.767E+01	6.122E+03	3.649E+03
37	0	74	0.000	131.868	0.000E+00	0.000E+00	4.689E+01	2.795E+01	6.183E+03	3.686E+03
38	0	74	0.000	131.868	0.000E+00	0.000E+00	4.419E+01	2.634E+01	5.828E+03	3.474E+03
39	0	74	0.000	131.868	0.000E+00	0.000E+00	4.994E+01	2.977E+01	6.585E+03	3.929E+03
40	0	73	0.000	130.086	0.000E+00	0.000E+00	5.033E+01	3.000E+01	6.547E+03	3.902E+03
41	0	74	0.000	131.868	0.000E+00	0.000E+00	4.999E+01	2.980E+01	6.592E+03	3.929E+03
42	0	74	0.000	131.868	0.000E+00	0.000E+00	4.549E+01	2.712E+01	5.999E+03	3.576E+03
44	0	73	0.000	130.086	0.000E+00	0.000E+00	6.211E+01	3.703E+01	8.080E+03	4.817E+03
45	0	150	0.000	267.300	0.000E+00	0.000E+00	6.673E+01	3.978E+01	1.784E+04	1.063E+04
46	0	176	0.000	313.632	0.000E+00	0.000E+00	6.673E+01	3.978E+01	2.093E+04	1.248E+04
47	0	231	0.000	411.642	0.000E+00	0.000E+00	7.519E+01	4.482E+01	3.095E+04	1.845E+04
48	0	214	0.000	381.348	0.000E+00	0.000E+00	7.659E+01	4.565E+01	2.921E+04	1.741E+04
49	0	226	0.000	402.732	0.000E+00	0.000E+00	7.755E+01	4.623E+01	3.123E+04	1.862E+04
50	107	0	381.348	0.000	7.684E+01	4.581E+01	0.000E+00	0.000E+00	2.930E+04	1.747E+04
51	107	0	381.348	0.000	1.043E+02	6.220E+01	0.000E+00	0.000E+00	3.979E+04	2.372E+04
52	71	0	253.044	0.000	8.456E+01	5.041E+01	0.000E+00	0.000E+00	2.140E+04	1.275E+04
53	125	0	445.500	0.000	1.423E+02	8.481E+01	0.000E+00	0.000E+00	6.338E+04	3.778E+04
54	90	184	320.760	327.888	1.001E+02	5.965E+01	1.044E+02	6.223E+01	6.633E+04	3.954E+04
55	197	0	702.108	0.000	1.337E+02	7.967E+01	0.000E+00	0.000E+00	9.384E+04	5.594E+04
56	161	0	573.804	0.000	1.267E+02	7.552E+01	0.000E+00	0.000E+00	7.269E+04	4.333E+04
57	71	0	253.044	0.000	1.438E+02	8.572E+01	0.000E+00	0.000E+00	3.639E+04	2.169E+04
58	86	0	306.504	0.000	1.012E+02	6.033E+01	0.000E+00	0.000E+00	3.102E+04	1.849E+04
59	89	0	317.196	0.000	1.123E+02	6.694E+01	0.000E+00	0.000E+00	3.562E+04	2.123E+04
60	84	0	299.376	0.000	1.332E+02	7.942E+01	0.000E+00	0.000E+00	3.989E+04	2.378E+04
61	4	0	14.256	0.000	1.376E+02	8.200E+01	0.000E+00	0.000E+00	1.961E+03	1.169E+03
62	71	0	253.044	0.000	1.331E+02	7.932E+01	0.000E+00	0.000E+00	3.367E+04	2.007E+04
63	89	0	317.196	0.000	1.372E+02	8.178E+01	0.000E+00	0.000E+00	4.352E+04	2.594E+04
64	100	0	356.400	0.000	1.422E+02	8.477E+01	0.000E+00	0.000E+00	5.068E+04	3.021E+04
65	71	0	253.044	0.000	1.482E+02	8.835E+01	0.000E+00	0.000E+00	3.750E+04	2.236E+04
66	87	0	310.068	0.000	1.566E+02	9.336E+01	0.000E+00	0.000E+00	4.856E+04	2.895E+04
67	130	0	463.320	0.000	1.427E+02	8.507E+01	0.000E+00	0.000E+00	6.612E+04	3.941E+04
68	70	0	249.480	0.000	1.363E+02	8.124E+01	0.000E+00	0.000E+00	3.400E+04	2.027E+04
<b>TOTALS</b>	<b>1810</b>	<b>2261</b>	<b>6450.84</b>	<b>4029.102</b>					<b>1071125.9</b>	<b>638498.2</b>

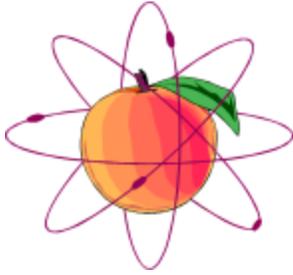
**NOTES:**

All results above represent the most-likely case.

In Run 30/30A, 585 X-slugs were dissolved in addition to the W-slugs. The data above reflect only the contribution from the W-slugs.

The number of slugs charged for Runs 41, 42 and 53 are estimated based on the known number shipped. (The normal practice was to use two of the W-4 slugs or one of the W-8 slugs shipped for RaLa for iodine production.)

Run 43 was a low-level break in run - only around 60 X-slugs were dissolved.



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## APPENDIX 3L

April 25, 1997

TO: Tom Widner  
ChemRisk - Alameda

FROM: R. E. Burns, Jr.  
Shonka Research Associates, Inc.

SUBJECT: Tube factors for the Hanford production reactors

MEMO NO: REB.005 C97

FINAL  DRAFT

Distribution:

Talaat Ijaz - ChemRisk - Cleveland  
Joe Shonka - Shonka Research Associates, Inc.

### References:

Due to the large number of references involved in the development of this information, direct references are made in text to the appropriate documents without summarizing them here. Documents from ORNL Central Files are referred to using the standard XX-YY-ZZZ format, where XX is the calendar year, YY is the month and ZZZ is the sequential document number. Teletypes from Hanford are identified with the prefix "TT". Memo reports from Hanford are identified with the prefix "HW".

### Memo:

The available references regarding RaLa operations at X-10 were reviewed for the purpose of compiling what we know about tube factors for the Hanford production reactors with respect to estimating radionuclide inventories for W-slugs used in RaLa production. The intent was to improve our basis for the tube factor bounds established previously and to revise these bounds and the model used to describe the distribution of factors between them as necessary. Recall that the previous approach for tube factors was to treat them as a triangular distribution between 1.1 and 1.6, with a most likely value of 1.4 (Burns, R. E.; "Bounds for the average values of  $^{131}\text{I}$  content per W-slug pushed for RaLa", REB.003 C96, April 12, 1996).

The tube factor is the relative power of a given tube with respect to the average for all tubes in a given reactor. Note that the tube factor is a measure of only the radial variation in power and does not account for axial variation. Axial power variation was addressed by using what the

Hanford staff referred to as “slug factors” (Moon, M. R.; Brugge, R. O.; “Slug and Tube Factors”, HW-31848, May 13, 1954). These will be the subject of a forthcoming document and are not addressed here.

All of the Hanford production reactors considered in the Task 1 effort (i.e., the B, D, F, H, DR and C reactors) had a total of 2004 process tubes on a 8.375 inch pitch. Thus, there would have been little variability in tube factors between the different piles as long as the fuel and poison loading patterns were kept consistent among them. The central tubes in the piles were loaded with poisons to flatten out the power distribution.

From review of the available references (teletypes) we have to date regarding irradiation histories for W-slugs used for RaLa production at X-10, we have tube factor values for 11 individual tubes. We also have tables of pile performance data that I extracted as handwritten notes from classified monthly production reports during a records search effort conducted at the DOE - Richland Records Holding Area in October of 1996. (These were submitted for classification review and were released to me before I left.) I extracted a total of eight of these summary tables for the months December of 1953, January of 1954, July of 1954, January of 1955, July of 1955, January of 1956, July of 1956 and October of 1956. (October of 1956 is the date of the last RaLa run conducted at X-10.)

The eleven tube factor values that we have (see Table 1) are only for tubes in the original three piles (B, D and F), and do not date beyond June of 1950. Thus, this information does not tell us how the tube factors may have differed for the later piles (H, DR and C) or how they may have changed over time. However, it does show us that RaLa slugs appear to have always been selected from tubes having a tube factor of at least 1.3, and thus the previous lower bound of 1.1 was likely too low. Even if the flattening for the B, D and F piles was increased in later years (resulting in a lower peak tube factor and less change with position), the fact that the tube factor data we have show that tubes having a factor greater than 1.3 were always used indicates that RaLa slugs were always selected from tubes in the central zone. (The tubes in the Hanford production reactors were broken up into three zones, with each zone characterized by a different tube inlet orifice diameter.) (Note that there is an error in document 50-4-9 in that one of the tube numbers is incomplete. I was not able to figure out what the number was supposed to be.)

While the information in Table 1 gives us an indication of the distribution in tube factors for RaLa slugs discharged from the original three piles through 1950, it does not tell us how this distribution might have changed beyond this time (due to changes in pile flattening or fuel loading), or what the distribution looked like for the later piles (H, DR and C). To address these issues, we need to look at the maximum tube factors for the various piles over time. This will tell us if there were any differences in power distribution between the different units, and if the distribution for a given unit changed over time.

The summary tables (see Fig. 1) contain information that allow us to estimate maximum tube factors for the piles for a given month. By assuming that the maximum power level that a given reactor achieved during a month corresponded to the maximum allowable tube power, one can compute the maximum tube factor by dividing the maximum allowable tube power by the average tube power. Under this

assumption, the tube factors computed represent upper limits for a given month, as any higher factor would have resulted in exceeding the allowable tube power for a given pile.

**Table 1 Known tube factors for the Hanford production piles**

<b>Push Date</b>	<b>Reference</b>	<b>Tube Number</b>	<b>Pile</b>	<b>Tube Factor</b>
January, 1949	49-2-190	2271	F	1.473
March, 1949	TT 00456, TT00487	2268	F	1.563
March, 1949	TT 00456, TT00487	2269	F	1.586
December, 1949	49-12-149	3283	B	1.334
December, 1949	49-12-149	3562	B	1.304
March, 1950	50-3-35	2964	D	1.339
March, 1950	50-3-35	3083	D	1.347
April, 1950	50-4-9	2464	D	1.329
April, 1950	50-4-9	?488?	D	1.336
June, 1950	50-6-49	1178	B	1.304
June, 1950	50-6-49	3364	B	1.301

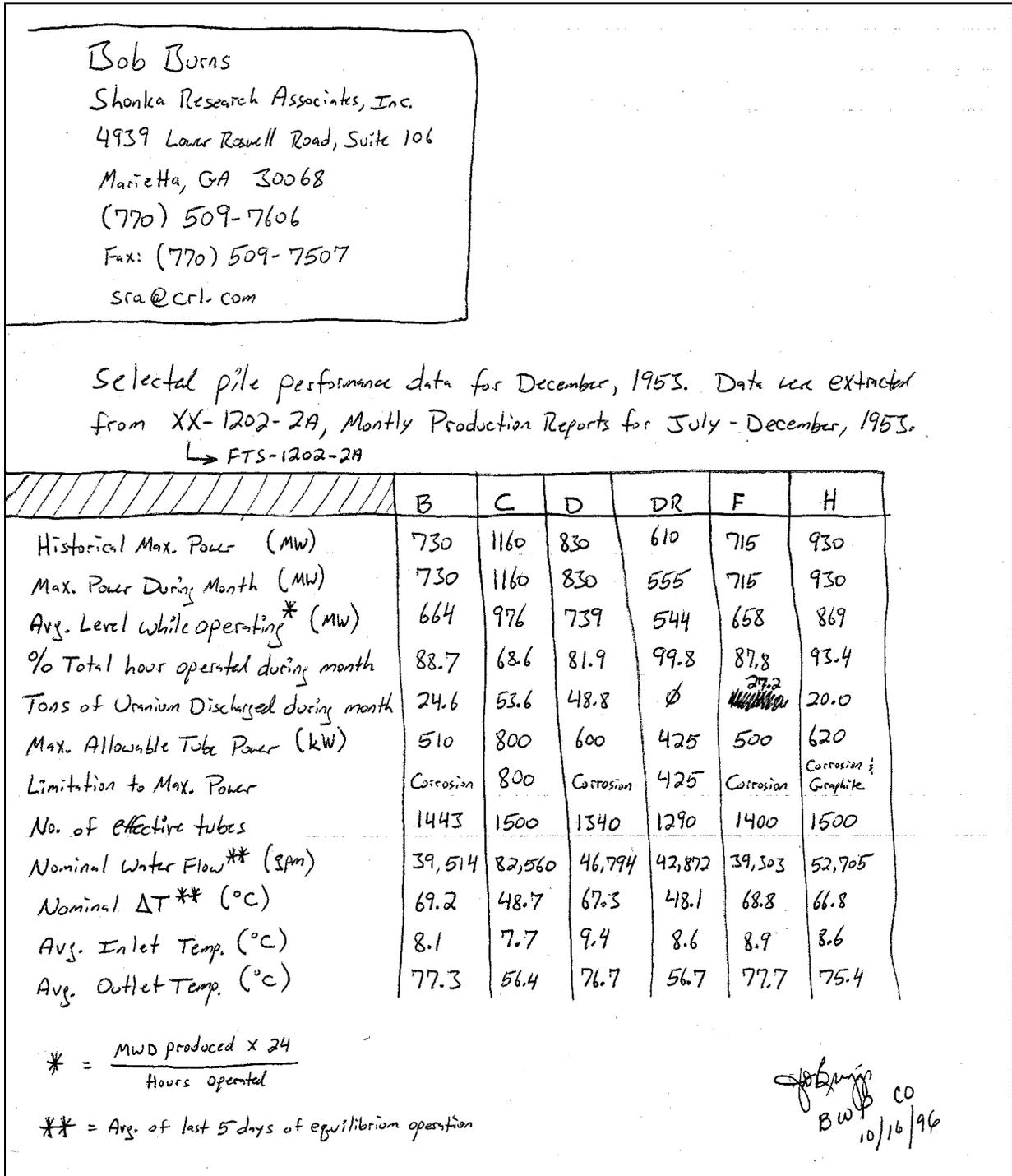
Fig. 2 shows the spreadsheet used for the calculation of the maximum (limiting) tube factor for each pile for each month where performance summary data were available. Note that the data in Fig. 2 do not address the period prior to December of 1953. (The H reactor came on line in October of 1949, the DR reactor in October of 1950 and the C reactor in November of 1952). Also, the B reactor was shut down during October and November of 1956.

The data in Fig. 2 show the H and C reactors had flatter power distributions than the other piles in the interval between December of 1953 and October of 1956, meaning these two reactors had lower peak tube factors than the others and that the factors changed less with distance from the pile center. The flatter power distribution seen for the H and C reactors is due to the use of slightly enriched fuel in the outer tubes, a practice began in January of 1953 (Ballinger, M. Y.; Hall, R. B.; "A History of Major Hanford Facilities and Processes Involving Radioactive Material", PNL-6964 HEDR, Pacific Northwest Laboratory, March, 1991).

The data also show that the maximum tube factors for the other four piles were in many cases below the upper bound of 1.6 used previously. Given these observations, the following approach was established for choosing the upper bound for tube factors for the various Hanford reactors over the time period of interest for the purpose of computing radionuclide inventories per slug:

- prior to December of 1953, and for any month thereafter for which we do not have a known upper limit for tube factors, the upper bound for tube factors for the B, D, F and DR reactors will be set to 1.6;
- after December of 1953, in any cases where the upper limit for tube factor exceeds 1.6 for the B, D, F or DR reactors, an upper bound of 1.6 will be used;

**Figure 1 Example of pile performance data extracted from Hanford monthly production reports**



**Figure 2 Spreadsheet for the calculation of maximum tube factors from the monthly pile performance data**

<b>B Reactor (power data in kW)</b>					<b>H Reactor (power data in kW)</b>				
<b>Period</b>	<b>Max. Power During Month</b>	<b>Avg. Power per Tube</b>	<b>Max. Tube Power</b>	<b>Max. Tube Factor</b>	<b>Period</b>	<b>Max. Power During Month</b>	<b>Avg. Power per Tube</b>	<b>Max. Tube Power</b>	<b>Max. Tube Factor</b>
December, 1953	730000	364.271	510	1.400	December, 1953	930000	464.072	620	1.336
January, 1954	747000	372.754	525	1.408	January, 1954	930000	464.072	620	1.336
July, 1954	905000	451.597	675	1.495	July, 1954	950000	474.052	570	1.202
January, 1955	1035000	516.467	805	1.559	January, 1955	1035000	516.467	670	1.297
July, 1955	925000	461.577	740	1.603	July, 1955	960000	479.042	640	1.336
January, 1956	935000	466.567	810	1.736	January, 1956	1156000	576.846	795	1.378
July, 1956	850000	424.152	635	1.497	July, 1956	1075000	536.427	663	1.236
October, 1956	N/A	N/A	N/A	N/A	October, 1956	1095000	546.407	699	1.279

<b>D Reactor (power data in kW)</b>					<b>DR Reactor (power data in kW)</b>				
<b>Period</b>	<b>Max. Power During Month</b>	<b>Avg. Power per Tube</b>	<b>Max. Tube Power</b>	<b>Max. Tube Factor</b>	<b>Period</b>	<b>Max. Power During Month</b>	<b>Avg. Power per Tube</b>	<b>Max. Tube Power</b>	<b>Max. Tube Factor</b>
December, 1953	830000	414.172	600	1.449	December, 1953	555000	276.946	425	1.535
January, 1954	848000	423.154	640	1.512	January, 1954	665000	331.836	525	1.582
July, 1954	775000	386.727	550	1.422	July, 1954	697000	347.804	575	1.653
January, 1955	1125000	561.377	810	1.443	January, 1955	780000	389.222	630	1.619
July, 1955	965000	481.537	710	1.474	July, 1955	935000	466.567	675	1.447
January, 1956	1060000	528.942	820	1.550	January, 1956	1075000	536.427	750	1.398
July, 1956	925000	461.577	635	1.376	July, 1956	945000	471.557	636	1.349
October, 1956	920000	459.082	668	1.455	October, 1956	965000	481.537	663	1.377

<b>F Reactor (power data in kW)</b>					<b>C Reactor (power data in kW)</b>				
<b>Period</b>	<b>Max. Power During Month</b>	<b>Avg. Power per Tube</b>	<b>Max. Tube Power</b>	<b>Max. Tube Factor</b>	<b>Period</b>	<b>Max. Power During Month</b>	<b>Avg. Power per Tube</b>	<b>Max. Tube Power</b>	<b>Max. Tube Factor</b>
December, 1953	715000	356.786	500	1.401	December, 1953	1160000	578.842	800	1.382
January, 1954	725000	361.776	525	1.451	January, 1954	1300000	648.703	800	1.233
July, 1954	824000	411.178	615	1.496	July, 1954	1365000	681.138	950	1.395
January, 1955	980000	489.022	800	1.636	January, 1955	1545000	770.958	1090	1.414
July, 1955	910000	454.092	720	1.586	July, 1955	1500000	748.503	975	1.303
January, 1956	985000	491.517	840	1.709	January, 1956	1725000	860.778	1125	1.307
July, 1956	855000	426.647	613	1.437	July, 1956	1600000	798.403	951	1.191
October, 1956	905000	451.597	665	1.473	October, 1956	1355000	676.148	885	1.309

- between January and December of 1953, and for any month thereafter for which we do not have a known upper limit for tube factors, the upper bound for tube factors for the C and H reactors will be set to 1.4;
- prior to January of 1953, the upper bound for tube factors for the H reactor will be set to 1.6;
- in cases where an upper limit is available for a given reactor and that values does not exceed 1.6, then that value will be used as the upper bound for tube factors.

The reason for choosing a upper bound of 1.6 for the months where the upper limit value in Fig. 2 exceeds 1.6 is that the upper limit values are estimates contingent on the assumption that the maximum power achieved by a given reactor during a month corresponded to a maximum tube power equal to the maximum allowable tube power. As this would likely not be the case, the upper limits given in Fig. 2 are therefore conservatively high. This is presumably why some of the upper limit values exceed 1.6. 1.6 is considered to be the highest value tube factors ever would have actually reached given it is unlikely that pile flattening would have ever been reduced for any reason. As time went on, efforts (such as using slightly enriched metal in the outer tubes) were made toward increasing the degree of flattening. Hence, a decrease in flattening was deemed unlikely.

Note the approach outlined above for choosing upper bounds for tube factors does not address the first two months of operation for the C reactor (November and December of 1952). This was intentional, as it is known that no RaLa slugs came from the C reactor during this time.

At this point we have established upper bounds for tube factors for all of the piles over the time period of interest, but with respect to corresponding lower bounds, we only have such information for the B, D and F reactors through June of 1950. Recall that a decrease in peak tube factor means an increase in pile flattening, and thus less change in tube factor as a function of distance from the center of a given pile. Hence, while a lower bound of 1.3 may be appropriate in cases where the peak tube factor is 1.6, a higher lower bound may be required in cases where the peak tube factor is lower.

Document HW-31848 contains both slug and tube factors calculated for the Hanford piles under the assumption of a cylindrical reactor model and that power distributions follow a cosine function outside of the central, flattened region. In the case of the tube factors, values are calculated using different flattening zone radii. These data can be used to establish appropriate lower bounds for tube factors based on corresponding upper bounds, as the upper bound is indicative of the degree of pile flattening, which in turn dictates the change in tube factor as a function of radius.

HW-31848 gives tube factors for eight cases, corresponding to eight different assumptions for flattening zone areas. These areas are given in terms of radius, where a radius of one equals the fuel channel pitch (8.375 inches). The eight radii are 0, 6, 10, 12, 14, 16, 18 and 20 units. The entire reactor is modeled as a cylinder having a radius such that its area equals that of the active pile lattice, i.e.,  $(8.375)^2 \times 2004$  tubes = 140,561.813 square inches. Using this value, one finds a circle having a radius of 25.256 pitch units (211.519 inches) represents the same area.

Four sets of data from HW-31848 are shown in Fig.'s 3, 4 and 5 below. These data are the calculated tube factors (under the cylindrical assumption) for the 2004 tube piles for four different flattening zone radii: 0, 6, 10 and 12 units.

Figure 3 Tube factors from HW-31848 for a flattening zone radius of 0

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TABLE VI

TUBE POWER FACTORS -- B, C, D, DR, F, AND H PILES

$R_f = 0$

Radius R	Area (L.U.) <sup>2</sup>	Ccs. Value	F	F <sup>2</sup>	F <sup>3</sup>
1	3.14	.9996	1.849	3.418	6.318
2	9.42	.9964	1.843	3.396	6.257
3	15.71	.9895	1.830	3.349	6.129
4	22.00	.9803	1.813	3.287	5.959
5	28.27	.9673	1.789	3.200	5.725
6	34.56	.9516	1.760	3.097	5.451
7	40.84	.9323	1.724	2.973	5.127
8	47.12	.9107	1.684	2.837	4.778
9	53.41	.8854	1.637	2.681	4.391
10	59.69	.8572	1.585	2.513	3.984
11	65.97	.8271	1.530	2.340	3.579
12	72.26	.7934	1.467	2.153	3.159
13	78.54	.7581	1.402	1.966	2.756
14	84.82	.7193	1.330	1.770	2.355
15	91.11	.6782	1.254	1.573	1.973
16	97.39	.6361	1.176	1.384	1.628
17	103.67	.5906	1.092	1.193	1.303
18	109.96	.5446	1.007	1.015	1.022
19	116.24	.4955	0.9163	0.8397	0.7694
20	122.52	.4446	0.8223	0.6762	0.5561
21	128.87	.3939	0.7286	0.5308	0.3867
22	135.09	.3404	0.6295	0.3963	0.2495
23	141.37	.2874	0.5315	0.2824	0.1501
24	147.65	.2318	0.4286	0.1837	0.0787
25	153.94	.1754	0.3243	0.1052	0.0341
25.26	41.00	.1547	0.2861	0.0819	0.0234
$\sum_1^{2004}$			2004	2433	3310

Figure 4 Tube factors from HW-31848 for a flattening zone radius of 6

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TABLE VI (continued)

$R_f = 6$

Radius <u>R</u>	Area <u>(L.U.)<sup>2</sup></u>	<u>Cos. Value</u>	<u>F</u>	<u>F<sup>2</sup></u>	<u>F<sup>3</sup></u>
1-6	113.10	1.0000	1.5666	2.451	3.838
7	40.84	.9993	1.565	2.448	3.831
8	47.12	.9941	1.556	2.422	3.770
9	53.41	.9836	1.540	2.372	3.652
10	59.69	.9677	1.515	2.296	3.478
11	65.97	.9472	1.483	2.200	3.262
12	72.26	.9212	1.442	2.080	3.001
13	78.54	.8902	1.394	1.943	2.708
14	84.82	.8554	1.339	1.794	2.402
15	91.11	.8151	1.276	1.629	2.079
16	97.39	.7705	1.206	1.455	1.756
17	103.67	.7230	1.132	1.281	1.450
18	109.67	.6704	1.050	1.102	1.157
19	116.24	.6143	0.9618	0.9251	0.8898
20	122.52	.5563	0.8710	0.7587	0.6608
21	128.87	.4939	0.7734	0.5981	0.4626
22	135.09	.4289	0.6716	.4511	0.3029
23	141.37	.3633	0.5688	3235	0.1840
24	147.65	.2940	0.4604	2120	0.0976
25	153.94	.2250	0.3522	1241	0.0437
25.26	41.00	.1977	0.3095	0958	0.0296
$\sum_{1}^{2004}$			2003	2338	2990

Figure 5 Tube factors from HW-31848 for flattening zone radii of 10 and 12

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TABLE VI (continued)

$R_f = 10$

Radius R	Area (L.U.) <sup>2</sup>	Cos. Value	F	F <sup>2</sup>	F <sup>3</sup>
1 - 10	314.16	1.000	1.401	1.964	2.752
11	65.97	.9990	1.400	1.960	2.744
12	72.26	.9910	1.389	1.929	2.678
13	78.54	.9752	1.367	1.868	2.552
14	84.82	.9516	1.334	1.778	2.372
15	91.11	.9205	1.290	1.664	2.147
16	97.39	.8821	1.236	1.528	1.889
17	103.67	.8368	1.173	1.375	1.612
18	109.96	.7848	1.100	1.210	1.330
19	116.24	.7266	1.018	1.037	1.056
20	122.52	.6626	0.9286	0.8623	0.8007
21	128.87	.5920	0.8296	0.6883	0.5710
22	135.09	.5180	0.7260	0.5270	0.3826
23	141.37	.4399	0.6165	0.3801	0.2343
24	147.65	.3584	0.5022	0.2522	0.1267
25	153.94	.2740	0.3839	0.1474	0.0566
25.26	41.00	.2199	0.3081	0.0949	0.0292
$\Sigma$			2004	2263	2742

$R_f = 12$

1 - 12	452.39	1.000	1.326	1.758	2.331
13	78.54	.9987	1.324	1.753	2.322
14	84.82	.9888	1.311	1.719	2.253
15	91.11	.9686	1.284	1.649	2.118
16	97.39	.9385	1.244	1.548	1.926
17	103.67	.8996	1.193	1.422	1.696
18	109.96	.8508	1.128	1.272	1.435
19	116.24	.7934	1.052	1.106	1.164
20	122.52	.7290	0.9665	0.9341	0.9028
21	128.87	.6561	0.8698	0.7566	0.6581
22	135.09	.5764	0.7643	0.5841	0.4464
23	141.37	.4924	0.6529	0.4262	0.2783
24	147.65	.4020	0.5329	0.2840	0.1513
25	153.94	.3074	0.4075	0.1661	0.0677
25.26	41.00	.2113	0.3275	0.1072	0.0351
$\Sigma$			2004	2219	2607

From inspection of the data in Fig.'s 3 through 5, one can see that a peak tube factor of 1.6 approximately corresponds to a flattening zone radius of 6 pitch units. [Calculation of the peak tube factor for a flattening zone radius of 5 gives a value greater than 1.6 (1.613).] The lower bound of 1.3 associated with the upper bound of 1.6 then approximately corresponds to a radius of 15 units. Thus, one can assert that this 15 unit radius corresponds to the set of tubes from which RaLa slugs were always chosen. Lower bounds for tube factors can then be chosen by determining the degree of pile flattening (in terms of cylindrical radius) based on the upper bound value and then setting the lower bound to the tube factor corresponding to a radius of 15 units. Using this approach, the following data

(Table 2) were compiled using the derived tube factors from HW-31848. Note all values were rounded to two significant digits. The lower bound value for the upper bound of 1.5 was calculated, as a flattening zone radius of 8 was not included in HW-31848.

**Table 2 Lower bounds for tube factors as a function of upper bound value**

<b>Upper Bound for Tube Factor</b>	<b>Flattening Zone Radius</b>	<b>Lower Bound for Tube Factor</b>
1.6	6	1.3
1.5	8	1.3
1.4	10	1.3
1.3	12	1.3
1.2	16	1.2

Now that both upper and lower bounds for tube factors have been established, the question becomes how does one characterize the frequency distribution for tube power in cases where the pile of origin for RaLa slugs is unknown? In the case where the pile of origin is not known, there is then an equal chance that the slugs came from any of the operating piles. This then defines a uniform distribution. Further, since the monthly operating power level is known for all piles during the period of interest, it is easy to establish which units represent the lower and upper bounds for tube power. However, the question remains what the distribution of tube power looks like between these upper and lower bounds. To address this correctly, one must recognize there are two factors at play: overlap in operating power levels for the piles and the fact that the data in Table 1 indicate that RaLa slugs were more often selected from tubes farther from the pile center and only rarely from tubes closer in.

Overlap in pile power levels would bias the frequency distribution for tube factors in that the probability associated with an overlapped region would be increased. Conversely, if there were not overlap between power levels, the tube power distribution would be discontinuous. To examine whether or not there was overlap between possible tube power levels for the piles, the power levels over the period of interest were reviewed to look for cases where there were large differences between the lowest power and highest power piles. Power levels were examined between 1951 and 1956, as piles of origin are fairly well known prior to 1951, and the pile power levels were quite consistent. For each year between 1951 and 1956, the month corresponding to the lowest power level for any of the operating piles was established. The power levels for all of the operating piles were then examined to see if the corresponding tube powers overlapped when tube factors were considered. The months examined were January of 1951, December of 1952, August of 1953, February of 1954, April of 1955 and February of 1956. In all of these cases except January of 1951, there was not continuous overlap between tube power levels. Thus, the distribution of tube powers cannot be established as a continuous distribution between the lowest and highest powered piles. In addition, while there is generally not continuous overlap between tube power levels over a given time period, overlap does typically exist between a few of the piles. This results in an increase in the likelihood of a given tube power occurring, an effect that must be accounted for when assessing the overall distribution of tube powers.

In light of the discussion above, it seems the only acceptable approach for accounting for the distribution in tube powers when computing radionuclide inventories for W-slugs for Task 1 will be to establish individual distributions for each possible pile of origin, and then uniformly sample from these to establish the aggregate distribution that represents the combined data set. To properly establish the distribution of tube powers for each possible pile of origin, the distribution of tubes chosen for RaLa slugs must be considered.

With respect to the distribution in tubes chosen for RaLa slugs, the data from Table 1 can be used. Inspection of these data show that the tubes chosen for RaLa slugs from the original three piles more often had tube factors in the range between 1.3 and 1.35, as there are only three cases where higher tube factors are seen. If one treats the data in Table 1 as six individual sets (corresponding to the six RaLa discharges they represent), it is seen that four out of the six times (66%) tubes with factors less than 1.35 were chosen, while tubes having factors near the maximum value were used two out of the six times (33%) - half the frequency of the lower-factor tubes. This means that the choice of tubes for RaLa slugs was either significantly biased toward tubes further from the pile center or that tubes close to poison columns were always selected. The later explanation is most unreasonable, and is easily dismissed if one computes the radial distance from the center tube for each tube in Table 1 and sorts by increasing radius.

The radial distance (r) from the center tube is computed by establishing the distance of each tube of interest from the pile center in both the x- and z-directions and then using the expression

$$r = \sqrt{(x)^2 + (z)^2} . \tag{1}$$

Distance is determined using the known pitch for the process tubes (8.375 inches). The x-direction is defined as going to the left or right from the center tube when facing the pile loading face, with left being negative and right being positive. The z-direction is defined as up and down, with up being positive. The radii for each tube in Table 1 and the corresponding tube factor are shown in Table 3. Note the data for the unknown tube number were omitted.

**Table 3 Known tube factors as a function of radius from pile center**

<b><u>Tube</u></b>	<b><u>Pile</u></b>	<b><u>Factor</u></b>	<b><u>x (inches)</u></b>	<b><u>z (inches)</u></b>	<b><u>r (inches)</u></b>
2271	F	1.473	-20.9375	-12.5625	24.417
2669	F	1.586	-37.6875	20.9375	43.113
2668	F	1.563	-46.0625	20.9375	50.598
2464	D	1.329	-79.5625	4.1875	79.673
2964	D	1.339	-79.5625	46.0625	91.934
3083	D	1.347	79.5625	54.4375	96.403
3283	B	1.334	79.5625	71.1875	106.761
1178	B	1.304	37.6875	-104.6875	111.265
3364	B	1.301	79.5625	-79.5625	112.518
3562	B	1.304	-96.3125	96.3125	136.206

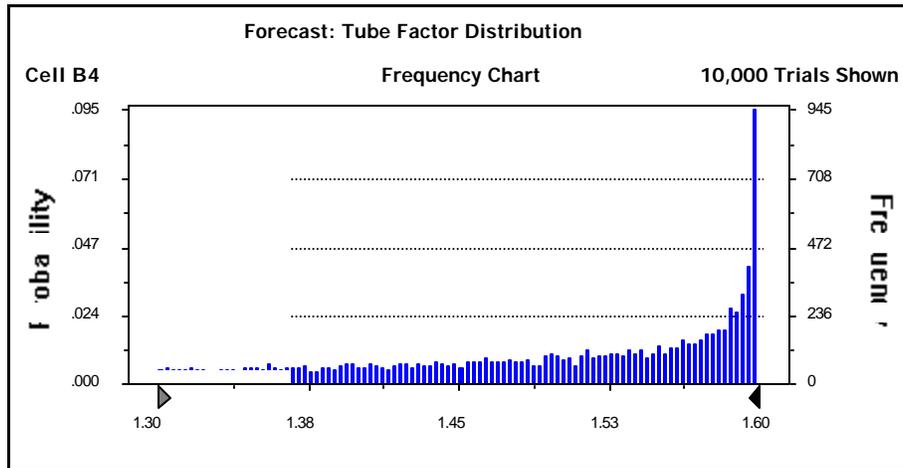
The data in Table 3 clearly show a correlation between tube factor and radius from the pile center<sup>1</sup>, meaning the choice of tubes for RaLa slugs was significantly biased toward tubes further out. Conversely, an arbitrary selection process would have resulted in a much different distribution. This can be illustrated by establishing an expression for tube factor as a function of radius and then sampling radius uniformly across its range.

Tube factors ranging between 1.3 and 1.6 can be described by the function

$$TF(r) = 1.6 \cos\left[\frac{\pi}{2}(r)\right] \quad (2)$$

where r is empirically defined as the interval  $0 \leq r \leq 0.3962$ . If one uniformly samples r on the defined interval, the distribution in Fig. 6 is obtained.

**Figure 6 Tube factors for arbitrary selection of tubes**



This distribution is clearly contrary to the observed distribution of tube factors from Tables 1 and 3, confirming that selection of RaLa tubes was biased toward tubes further from the pile center (but still within the central zone defined by a radius of 15 pitch units under the cylindrical model). Thus, it appears tube factors (and consequently, tube powers) for a given pile should be established through sampling of a cosine function that gives tube factor as a function of position, where the sampling is biased so that outer positions are selected with twice the frequency of the inner ones.

Through trial-and-error, it was found that defining the radius parameter (r) as a Beta distribution bounded between 0 and 39.62 and having parameters alpha and beta equal to 4.25 and 1.00, respectively, would represent the desired distribution of tube factors. The parameter r from Eq. 2 was

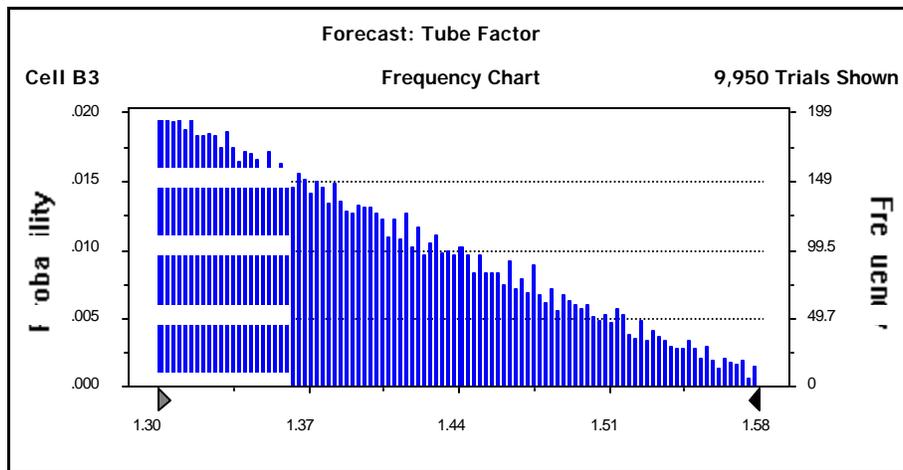
<sup>1</sup> It is presumed the factor for tube 2271F is lower than those for tubes 2268F and 2269F because it was so near the flattening region.

multiplied by 100 because Crystal Ball™ only allows values to two decimal places. Eq. 2 was therefore modified to

$$TF(r) = 1.6 \cos \left[ \frac{P}{2} \left( \frac{r}{100} \right) \right] \quad (3)$$

The desired value of the alpha parameter was established by comparing the ratio of the area under the tube factor probability curve between 1.30 and 1.35 to that for the interval 1.47 to 1.60. Alpha was varied until this ratio achieved the value 2.0. For alpha = 4.25 and beta = 1.00, the probability associated with the range 1.30 to 1.35 was 35.31%, versus a probability of 17.65% for the range 1.47 to 1.60. The entire frequency distribution is shown in Fig. 7 below.

**Figure 7 Frequency distribution for tube factors represented using a Beta distribution**



It is shown that applying Eq. 3 with  $r$  sampled as a Beta distribution bounded between 0 and 39.62 and with alpha and beta equal to 4.25 and 1.00, respectively, provides an adequate representation of the observed selection of tubes for RaLa slugs for tube factors bounded between 1.3 and 1.6. Hence, distributions for the other tube factor ranges given in Table 2 are defined by simply changing the bounds on  $r$  and  $TF_{max}$  to give the desired range, where  $TF_{max}$  is the upper bound of the tube factor range. The Beta distribution parameters alpha and beta do not change. Eq. 4 is then used to establish the frequency distribution for tube factors for any of the ranges given in Table 2. (Obviously, there is no need to establish distributions in cases where the piles are flattened to such an extent there is no distinction between the upper and lower tube factor bounds.)

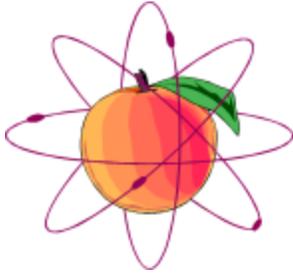
$$TF(r) = TF_{max} \cos \left[ \frac{P}{2} \left( \frac{r}{100} \right) \right] \quad (4)$$

Table 4 gives the appropriate bounds for  $r$  for each tube factor range from Table 2.

**Table 4 Beta distribution parameters for establishing frequency distributions for tube factors for W-slug inventory calculations**

<b>TF Range</b>	<b>TF<sub>max</sub></b>	<b>Bounds for r</b>	<b>Alpha</b>	<b>Beta</b>
1.3 - 1.6	1.6	0.00 - 39.62	4.25	1.00
1.3 - 1.5	1.5	0.00 - 33.25	4.25	1.00
1.3 - 1.4	1.4	0.00 - 24.21	4.25	1.00

The one issue that remains to be addressed with respect to tube factors is tube factors in cases where a tube number is known, but the actual tube factor is not. This occurs a few times for runs between 1948 and 1950. Thus, the data from Table 3 (tube factor versus radius) can be used to establish appropriate tube factor values. The radius for the tube of interest would be calculated and compared with the radii from Table 3. A range of tube factors would then be established based on where the radius for the tube of interest fell with respect to those for which tube factors are known.



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## APPENDIX 3M

April 28, 1997

TO: Tom Widner  
ChemRisk - Alameda

FROM: R. E. Burns, Jr.  
Shonka Research Associates, Inc.

SUBJECT: Slug factors for the Hanford production reactors

MEMO NO: REB.007 C97

FINAL [**X**] DRAFT [ ]

Distribution:  
Talaat Ijaz - ChemRisk - Cleveland  
Joe Shonka - Shonka Research Associates, Inc.

References:

1. REB.005 C97, "Tube factors for the Hanford production reactors" memo from R. E. Burns, Jr. to Tom Widner dated April 25, 1997.
2. Moon, M. R.; Brugge, R. O.; "Slug and Tube Factors", HW-31848, May 13, 1954.
3. REB.003 C96, "Bounds for average values of  $^{131}\text{I}$  content per W-slug pushed for RaLa" memo from R. E. Burns, Jr. to Tom Widner dated April 12, 1996.

### Memo:

A memo was issued previously that addressed tube factors for the Hanford production reactors for the purpose of computing radionuclide inventories for W-slugs used in RaLa production at X-10 [1]. That memo made reference to the fact a subsequent memo would be provided describing the basis for slug factors for the Hanford piles of interest. Thus, this memo (REB.007 C97) was developed to serve that purpose. It also provides fractions of total tube power contributed by a given number of slugs taken from the center of a tube. This fractional tube power information is needed because only the highest power slugs pushed from a given tube were actually used for RaLa.

The slug factor is the fraction of the total power for a given tube produced by a specific slug. Tube factors then describe the axial variation in power along a tube, and are a function of axial

position. Conversely, a tube factor is the relative power of a given tube with respect to the average for all tubes in a given reactor. Tube factors then represent the radial variation in tube power for a given reactor.

Ref. [2] provides tabulated slug factors for the six Hanford reactors of interest with respect to RaLa production at X-10 between 1948 and 1956. All six of these reactors (the B, D, F, H, DR and C units) contained 2004 process tubes on a 8.375 inch pitch. As the standard charge (number of slugs per tube) for all six reactors was the same, there was no difference in slug factors among them. The slug factors given in Ref. [2] were computed assuming the distribution of power along a tube was a symmetric cosine function having its peak value at the tube's center. They are computed for a standard charge of 32 eight-inch slugs, with slug number 1 being the upstream slug (i.e., the one closest to the loading face of the pile). The tabulated slug factors (f) from HW-31848 are presented in Fig. 1.

As Fig. 1 only contained slug factors for channels containing 32 eight-inch slugs, factors for channels containing 64 four-inch slugs had to be calculated. The calculated factors are shown in Fig. 2.

**Figure 1 Slug factors (f) for Hanford pile tubes containing 32 eight-inch slugs**

DECLASSIFIED							
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TABLE II							
32-SLUG COLUMN							
SLUG FACTORS							
Slug No.	Cos. Value	r	$\sum^N r$	r <sup>2</sup>	F <sup>2</sup>	$\sum^N F^2$	$\sum^N r^2 / \sum^N f$
1	.2164	.0095	.0095	.0009	.0026	.0026	.2737
2	.3007	.0133	.0228	.0018	.0052	.0078	.3421
3	.3827	.0169	.0397	.0029	.0083	.0161	.4056
4	.4617	.0204	.0601	.0042	.0120	.0281	.4676
5	.5373	.0237	.0838	.0056	.0160	.0441	.5263
6	.6088	.0268	.1106	.0072	.0206	.0647	.5850
7	.6756	.0298	.1404	.0089	.0255	.0902	.6425
8	.7373	.0325	.1729	.0106	.0304	.1206	.6975
9	.7934	.0350	.2079	.0123	.0352	.1558	.7494
10	.8434	.0372	.2451	.0138	.0395	.1952	.7968
11	.8860	.0391	.2842	.0152	.0435	.2388	.8403
12	.9239	.0407	.3249	.0166	.0475	.2863	.8812
13	.9537	.0420	.3669	.0176	.0504	.3367	.9177
14	.9763	.0430	.4099	.0185	.0530	.3897	.9507
15	.9914	.0437	.4536	.0191	.0547	.4444	.9797
16	.9990	.0440	.4976	.0194	.0556	.5000	1.005
17	.9990	.0440	.5416	.0194	.0556	.5556	1.026
18	.9914	.0437	.5853	.0191	.0547	.6103	1.043
19	.9763	.0430	.6283	.0185	.0530	.6633	1.056
20	.9537	.0420	.6703	.0176	.0504	.7137	1.065
21	.9239	.0407	.7110	.0166	.0475	.7612	1.071
22	.8860	.0391	.7501	.0152	.0435	.8047	1.073
23	.8434	.0372	.7873	.0138	.0395	.8442	1.072
24	.7932	.0350	.8223	.0123	.0352	.8794	1.069
25	.7373	.0325	.8548	.0106	.0304	.9098	1.064
26	.6756	.0298	.8846	.0089	.0255	.9353	1.057
27	.6088	.0268	.9114	.0072	.0206	.9559	1.049
28	.5373	.0237	.9351	.0056	.0160	.9719	1.039
29	.4617	.0204	.9555	.0042	.0120	.9839	1.030
30	.3827	.0169	.9724	.0029	.0083	.9922	1.020
31	.3007	.0133	.9857	.0018	.0052	.9974	1.012
32	.2164	.0095	.9952	.0009	.0026	1.000	1.005

**Figure 2 Slug factors for Hanford pile tubes containing 64 four-inch slugs**

<u>Slug Number</u>	<u>Increment</u>	<u>Cosine Value</u>	<u>Slug Factor</u>	<u>Slug Number</u>	<u>Increment</u>	<u>Cosine Value</u>	<u>Slug Factor</u>
1	31.5	0.1951	0.0043	33	0.5	0.9998	0.0221
2	30.5	0.2377	0.0053	34	1.5	0.9979	0.0221
3	29.5	0.2798	0.0062	35	2.5	0.9941	0.0220
4	28.5	0.3214	0.0071	36	3.5	0.9884	0.0219
5	27.5	0.3624	0.0080	37	4.5	0.9808	0.0217
6	26.5	0.4027	0.0089	38	5.5	0.9713	0.0215
7	25.5	0.4423	0.0098	39	6.5	0.9600	0.0213
8	24.5	0.4810	0.0107	40	7.5	0.9469	0.0210
9	23.5	0.5188	0.0115	41	8.5	0.9320	0.0206
10	22.5	0.5556	0.0123	42	9.5	0.9153	0.0203
11	21.5	0.5913	0.0131	43	10.5	0.8969	0.0199
12	20.5	0.6259	0.0139	44	11.5	0.8767	0.0194
13	19.5	0.6593	0.0146	45	12.5	0.8549	0.0189
14	18.5	0.6915	0.0153	46	13.5	0.8315	0.0184
15	17.5	0.7224	0.0160	47	14.5	0.8064	0.0179
16	16.5	0.7518	0.0167	48	15.5	0.7799	0.0173
17	15.5	0.7799	0.0173	49	16.5	0.7518	0.0167
18	14.5	0.8064	0.0179	50	17.5	0.7224	0.0160
19	13.5	0.8315	0.0184	51	18.5	0.6915	0.0153
20	12.5	0.8549	0.0189	52	19.5	0.6593	0.0146
21	11.5	0.8767	0.0194	53	20.5	0.6259	0.0139
22	10.5	0.8969	0.0199	54	21.5	0.5913	0.0131
23	9.5	0.9153	0.0203	55	22.5	0.5556	0.0123
24	8.5	0.9320	0.0206	56	23.5	0.5188	0.0115
25	7.5	0.9469	0.0210	57	24.5	0.4810	0.0107
26	6.5	0.9600	0.0213	58	25.5	0.4423	0.0098
27	5.5	0.9713	0.0215	59	26.5	0.4027	0.0089
28	4.5	0.9808	0.0217	60	27.5	0.3624	0.0080
29	3.5	0.9884	0.0219	61	28.5	0.3214	0.0071
30	2.5	0.9941	0.0220	62	29.5	0.2798	0.0062
31	1.5	0.9979	0.0221	63	30.5	0.2377	0.0053
32	0.5	0.9998	0.0221	64	31.5	0.1951	0.0043

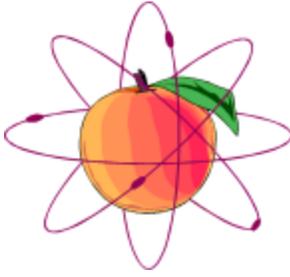
The data in Fig.'s 1 and 2 can be used to calculate the power contributed by an individual slug in the case where the total tube power is known. However, for the purpose of calculating radionuclide inventories for RaLa slugs, it is more useful to use these data to compute the fraction of the total tube power contained in a given set of slugs, e.g., a fixed number of slugs from the center of the tube. This fraction is simply the sum of the cosine values for the slugs of interest divided by the sum for the whole channel.

Not all slugs pushed from a given tube were actually used for RaLa production. Instead, only the highest power slugs from a given tube were shipped with the rest going to waste. (The burnups were typically too low for them to have significant plutonium content.) Hence, two assumptions were established previously: 1) for 32 slug tubes (eight-inch slugs), only the center 18 were used for RaLa; and 2) for 64 slug tubes (four-inch slugs), only the center 38 slugs were used [3].

Referring to Fig. 1, the center 18 slugs from a 32 slug tube would be slug numbers 8 through 25. By summing the cosine values for these slugs and dividing by the sum for all slugs, one finds that the center 18 slugs from a 32 slug tube provide 71.8% of the tube's power. This value can be used to scale radionuclide inventory results computed from an entire tube to get the inventory contained in just the center 18 slugs.

Referring to Fig. 2, one sees that the center 38 slugs for a 64 slug tube would be numbers 14 through 51. The fraction of the total tube power contained in these 38 slugs is computed to be 74.9%.

If there are cases where it is known that a different number of center slugs were used from a particular tube, then the data in Fig.'s 1 or 2 (as appropriate) would be used to compute the fraction of total tube power produced by the slugs of interest in the same manner as above.



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## APPENDIX 3N

May 19, 1997

TO: Tom Widner  
ChemRisk - Alameda

FROM: R. E. Burns, Jr.  
Shonka Research Associates, Inc.

SUBJECT: Decay times for W-slugs

MEMO NO: REB.004 C97

FINAL [X] DRAFT [ ]

Distribution:  
Talaat Ijaz - ChemRisk - Cleveland  
Joe Shonka - Shonka Research Associates, Inc.

References:  
Due to the large number of references involved in the development of this information, direct references are made in text to the appropriate documents without being summarized here. Document HANFORD 45828 is a collection of 100 area monthly reports for the Hanford site for the calendar year 1949. These reports provide detailed summaries of pile operations for each pile from January through November of that year. Documents from the X-10 Central Files are referred to using the standard XX-YY-ZZZ format, where XX is the calendar year, YY is the month and ZZZ is the sequential document number. Likewise, logbooks are referred to by their assigned logbook numbers.

Memo:

The available references regarding RaLa operations at X-10 were reviewed for the purpose of compiling what we know about decay times for fuel slugs discharged from the various Hanford production reactors and shipped to X-10 for RaLa production. Note that the start of the decay time for RaLa slugs is when the reactor was shut down prior to discharge, and not the time when discharge actually occurred. In the case of Hanford pile operations, the time between shutdown for discharge and subsequent restart was around 24 hours. Hence, the elapsed time between shutdown and actual discharge needs to be accounted for. Likewise, the end of the decay interval is defined as the start of the first dissolving, and not the start of coating removal or slug charging.

Review of the available information resulted in two sets of data being compiled: cases where time of pile shutdown was known, and cases where only a push date was known. Both sets of data are summarized below by RaLa run number, followed by conclusions. Note that in some cases, the time when the first cut began is known exactly, and in others, this time is known only approximately. I have used the word “around” to denote judgment on my part based on my familiarity with RaLa operations at X-10. Precision for the given decay times is to the nearest 12 hours (0.5 day). Also note that all times and dates have been adjusted to the eastern time zone.

**RaLa runs for which the time of pile shutdown is known:**

Run 29:

Pile shutdown time: 22:20 hours on 1/4/49 [HANFORD 45828]  
First cut: 1/10/49 [49-1-184]  
Decay time: around 5.5 days

Run 30:

Pile shutdown time: 05:20 hours on 2/8/49 [HANFORD 45828]  
First cut: 2/14/49 [49-4-35]  
Decay time: around 6.5 days

Run 31:

Pile shutdown time: 00:20 hours on 3/15/49 [HANFORD 45828]  
First cut: 3/20/49, morning [logbook A-37 part I]  
Decay time: around 5.5 days

Run 32:

Pile shutdown time: 03:50 hours on 4/12/49 [HANFORD 45828]  
First cut: 4/18/49, around 02:00 hours [logbook A-37 part I]  
Decay time: 6.0 days

Run 33:

Pile shutdown time: 04:00 hours on 5/18/49 [HANFORD 45828]  
First cut: 5/24/49, around 06:00 hours [logbook A-37 part I]  
Decay time: 6.0 days

Run 34:

Pile shutdown time: 22:31 hours on 7/5/49 [HANFORD 45828]  
First cut: 7/11/49, midnight [logbook A-37 part I]  
Decay time: 6.0 days

Run 35:

Pile shutdown time: 01:20 hours on 8/10/49 [HANFORD 45828]  
First cut: 8/15/49, around 10:00 hours [logbook A-37 part I]  
Decay time: 5.5 days

Run 36:

Pile shutdown time: 02:35 hours on 10/4/49 [HANFORD 45828]  
First cut: 10/10/49, around 02:00 hours [logbook A-37 part II]  
Decay time: 6.0 days

Run 37:

Pile shutdown time: 07:50 hours on 11/16/49 [HANFORD 45828]  
First cut: 11/21/49, around 02:00 hours [logbook A-37 part II]  
Decay time: 5.0 days

Data summary for runs where pile shutdown time is known:

Run Number	Decay Time
29	around 6.5 days
30	around 5.5 days
31	around 6.0 days
32	6.0 days
33	6.0 days
34	6.0 days
35	5.5 days
36	6.0 days
37	5.0 days

**RaLa runs for which only the push date is known:**

The estimated decay times given below include time to account for the decay between the time of pile shutdown and the time the slugs were pushed. A nominal interval of 12 hours was used. For Runs 51 and 53, there were problems with slugs getting stuck in chute during loading that resulted in extended decay times. For Run 55, there was a long delay between slug discharge and shipping that resulted in a much longer than usual decay time.

Run 51:

Push date: 9/18/52 [52-9-113]  
First cut: 9/25/52, around 00:00 hours [logbook A-379]  
Decay time: around 7.0 days

Run 53:

Push date: 6/27/53 [53-6-211]  
First cut: 7/4/53 at 13:30 hours [logbook A-429]  
Decay time: around 7.5 days

Run 55:

Push date: 1/5/54 [54-1-42]  
First cut: 1/16/54 at 21:00 hours [logbook A-429]  
Decay time: around 11 days

Run 57:

Push date: 7/12/54 [54-7-61]  
First cut: 7/17/54 at around 16:00 hours [logbook A-616]  
Decay time: around 5.5 days

Run 58:

Push date: 10/18/54 [54-10-85]  
First cut: 10/23/54, afternoon [logbooks A-429 and A-616]  
Decay time: around 5.5 days

Run 59:

Push date: 02/25/55 [55-3-9]  
First cut: 03/02/55 around 16:00 hours [logbook A-664]  
Decay time: around 5.5 days

Run 68:

Push date: 10/14/56 [56-10-57]  
First cut: 10/21/56, around 17:00 hours [logbook A-429]  
Decay time: around 7.0 days

Data summary for runs where only the push date is known:

Run Number	Decay Time
51	around 7.0 days
53	around 7.5 days
55	around 11.0 days
57	around 5.5 days
58	around 5.5 days
59	around 5.5 days
68	around 7.0 days

**Conclusions:**

The two sets of decay times detailed above are combined below.

Run Number	Decay Time
29	around 6.5 days
30	around 5.5 days
31	around 6.0 days
32	6.0 days
33	6.0 days
34	6.0 days
35	5.5 days
36	6.0 days
37	5.0 days
51	around 7.0 days
53	around 7.5 days
55	around 11.0 days
57	around 5.5 days
58	around 5.5 days
59	around 5.5 days
68	around 7.0 days

If one treats the above data as a single set and ignores the subjective nature of many of the points, the following distribution is obtained:

Decay Time	Number of Occurrences
5.0 days	1
5.5 days	5
6.0 days	5
6.5 days	1
7.0 days	2
7.5 days	1
11.0 days	1

Thus, for the sixteen cases for which decay time can be established, the most likely decay interval between reactor shutdown and the start of dissolving was 5.5 to 6.0 days (10 out of 16 times or 62%). Eleven out of the sixteen intervals (69%) occur in the range from 5.0 to 6.0 days. There are three intervals (19%) in the range 6.0 to 7.0 days and two that are greater than 7.0 days (12%).

Recognize that the distribution data described above are days of decay time, and not the magnitude of the decay itself. The magnitude of decay as a function of decay time is obviously a function of the nuclide or combination of nuclides of interest, and is inherently logarithmic in terms of frequency distribution. Conversely, the distribution for days of decay time should be treated as uniform between the appropriate lower and upper bounds in cases where the actual decay interval is unknown. (There was an error made in the Hanford study where decay was inappropriately sampled uniformly rather than as a logarithmic distribution) (PNWD-2222 HEDR, page 4.17, item 4).

For nuclides that do not experience significant ingrowth from precursors, the magnitude of decay is computed by simply applying the known half-life of the species of interest. With respect to decay calculations for Task 1, this would apply for both  $^{131}\text{I}$  and  $^{140}\text{Ba}$ . However, for the total iodine values, simple decay is not the case. The presence of the stable fission product  $^{127}\text{I}$  in the total iodine values makes it necessary to establish decay expressions that are a function of irradiation time. This is due to the fact there is no decay associated with the stable iodine. Hence, the quantity present in irradiated nuclear fuel always increases with increased irradiation time. There is never any decay, and no equilibrium condition can be established (loss from neutron absorption reactions is being negated here.) The quantitative expression for computing the decay of the total iodine inventory versus time is therefore a strong function of the amount of  $^{127}\text{I}$  present in the fuel at discharge, since, in limit, the decay expression reaches an asymptote at this amount when time becomes large with respect to the effective half life of the radioactive fission product iodines.

In the inventory calculations performed for the W-slug RaLa runs, there were in general three irradiation durations used to compute the ingrowth of fission products in the slugs. For the earlier W-slug runs, irradiation time was bounded between 50 and 100 days. A larger interval of 14 to 100 days was used for runs that took place after 1951. There were also runs where the actual irradiation time was known, however, in all of these cases the durations were close enough to one of the three “standard” durations that no distinction was deemed necessary for the purpose of computing percent saturation or decay. Thus, three expressions are needed to compute decay of the total iodine results from the W-slug inventory calculations, corresponding to the three irradiation durations 14, 50 and 100 days.

The general expression for computing decay for the total iodine inventories is

$$f(t) = ae^{bt} + ce^{dt}$$

where  $f(t)$  is the fraction remaining at time  $t$ ,  
 $t$  is the elapsed time in days since reactor shutdown, and  
 $a$ ,  $b$ ,  $c$  and  $d$  are constant coefficients.

The coefficients required to compute decay for the total iodine values for each irradiation duration are given in the table below. These values were obtained through fitting total iodine results from ORIGEN2.1 as a function of time for the three irradiation times of interest.

	<b>Irradiation Duration</b>		
<b>Coefficient</b>	<b>14 days</b>	<b>50 days</b>	<b>100 days</b>
a	0.6810	0.7971	0.8741
b	-0.0362	-0.0203	-0.0104
c	0.3190	0.2029	0.1259
d	-0.4477	-0.4749	-0.4433

## APPENDIX 30

### DOCUMENTS PERTAINING TO THE 1954 RALA ACCIDENT

1. April 30, 1954 memorandum from W. M. Stanley Jr., Laboratory Shift Supervisor, to C. E. Larson, ORNL Director; Subject: "Area Contamination on April 29, 1954." (partial copy, 2 pages).
2. May 3, 1954 memorandum from W. M. Stanley Jr., Laboratory Shift Supervisor, to M. E. Ramsey; Subject: "3026 Incident 4/29/54 4:48 p.m." (2 pages).
3. May 10, 1954 memorandum from W. M. Stanley Jr., Laboratory Shift Supervisor, to M. E. Ramsey; Subject: "3026-D Incident of April 29, 1954" (4 pages).
4. Pages from X-10 Health Physics notebook A-569 for 4/29/54 (4 pages).
5. "RaLa Production – 1954" by A. F. Rupp and E. J. Witkowski. ORNL Central Files Number 55-1-211 (Partial copy, 3 pages).
6. June 2, 1954 memorandum from C.E. Larson to K. A. Kasschau of the USAEC; Subject: "RaLa Production." (4 pages).

# INTER-COMPANY CORRESPONDENCE

OAK RIDGE NATIONAL LABORATORY

Operated By

CARBIDE AND CARBON CHEMICALS COMPANY

Post Office Box P  
OAK RIDGE, TENN

(INSERT  
NAME) COMPANY

LOCATION

MAY 3 1954

TO C. E. Larson  
LOCATION Building 4500

DATE April 30, 1954, 8:00 a.m.

ANSWERING LETTER DATE

ATTENTION

COPY TO K. Z. Morgan  
A. F. Rupp

SUBJECT AREA CONTAMINATION ON  
APRIL 29, 1954

About 5:15 p.m. on April 29, 1954, a large amount of activity was released on top of the RaLa process cell in Building 3026D. The activity was released from the slug dissolver through the slug loading chute and solution addition lines during addition of nitric acid (about 390 pounds of 60%) for a dissolving. One hundred and one Hanford slugs had been loaded for this run and three successful dissolvings of about eighteen slugs each had already been made. Release of the activity continued for about two hours, i.e., until such time as the reaction was controlled enough for the regular hot off gas system to take care of it. Between the third dissolving and the fourth (this one) the slugs were allowed to set dry in the dissolver for about twenty-eight hours, i.e., no solution covered them (this is customary). It is at present thought that during this time the slugs became very hot thermally (indications are that these slugs are some hotter radioactively than any previously received), and upon addition of the nitric acid a much faster reaction than usual was experienced. (Operations will write a complete report of the incident.)

The wind direction during this time was mostly from south. Of the major buildings high air activity occurred in RaLa Process (Building 3026), Radioisotope Area (all buildings), Rolling Mill (Building 3012), Bulk Shielding Reactor (Building 3010), LTR (Building 3005), Hot Research Shop (Building 3006), and later to some extent in the Graphite Reactor (Building 3001). The high activity was noted by the people in the occupied buildings, 3010 and 3005, and evacuation was complete by about 5:25 p.m. The LTR was shut down from 5:15 p.m. to 7:32 p.m.; the Graphite Reactor was shut down from 6:00 p.m. to 7:08 p.m. There were seven people in this area at the time of the initial release, one in LTR, four in Bulk Shielding Reactor, and two guards at Post #16. The personal clothing of these people was contaminated, and was taken by Health Physics. The people were cleaned up to about tolerance levels and left the plant at midnight. The operators and analytical people in 3026D, RaLa Process Building, evacuated the building immediately on hearing the radiation monitors and were not contaminated.

After the incident some attempt was made to start cleaning the top of the RaLa Cells from the windows on the roof about twenty feet above the cells. The radiation levels at these windows was greater than 10 R/hour. Because of the very high radiation levels and the doubt of the effectiveness of the decontamination work tried, this was temporarily abandoned.

April 30, 1954

and the effort was concentrated on the other major buildings involved. Sixteen janitors were held over from the 4-12 shift for decontamination work. All horizontal surfaces in Buildings 3037, 3038, 3006, 3005, and 3010 were cleaned and indications at 7:30 a.m. are that they are below tolerance. Except for Building 3026, the level of contamination was about 1 to 5 mr/hour. The only major building contaminated except 3026 and not cleaned by 8:00 a.m. is the Rolling Mill, Building 3012. The roadways in the area involved were washed and all seem to be below tolerance levels at 8:00 a.m.

All people involved in the incident and later in the high level decontamination work are being given the standard HP check including urine checks, etc. A preliminary check of some of the film badges is attached. Health Physics will write a complete report of the incident from their angle.

Samples were taken of the Settling Basin: Outlet at 7:00 a.m. showed 235 counts; inlet sample showed 651 counts at 7:00 p.m., 10,335 counts at 11:00 p.m. and 1,117 counts at 3:00 a.m. White Oak Dam checks at 2:30 a.m. showed 24 counts and at 5:30 a.m. showed 16 counts; it will be several hours before this activity reaches the dam.

Present indications are that the activity has a half life of about twenty hours. Radiation seems to be generally very hard.

Radiation levels in Building 3026D reached more than 100 R/hour on the third level. At 7:00 a.m. the first floor was about 100 mr/hour and air activity was below tolerance levels. Processing of the first part of the RaLa run is proceeding; because of the apparent rapid decay it is planned to wait until Sunday night before trying to continue with the second part.

The air monitor at the rock quarry on Bethel Valley Road showed a very slight rise after the incident.

  
Laboratory Shift Supervisor

Attachment:  
HP Check mentioned  
above.

EMK:jl

# INTER-COMPANY CORRESPONDENCE

OAK RIDGE NATIONAL LABORATORY

Operated By

CARBIDE AND CARBON CHEMICALS COMPANY

Post Office Box P  
OAK RIDGE, TENN.

(INSERT  
NAME)

COMPANY

LOCATION

TO M. E. Ramsey  
LOCATION Building 4500

DATE May 3, 1954

ANSWERING LETTER DATE

ATTENTION  
COPY TO

SUBJECT 3026 Incident 4/29/54  
4:48 p.m.

At approximately 5:00 this office was informed of a radiation incident in 3026 Building by Guard Headquarters. On arrival it was found that a dissolving reaction involving Hanford material and nitric acid had gotten away, blowing dissolver solution back onto the top level of the 3026 cell block. A plume of nitric fumes could be seen billowing from the third level windows, east side. Steps were taken immediately to see that 3026 and the Isotope Area were evacuated. Building 3026 was evacuated almost immediately, all personnel making use of masks in their escape. The Isotope Area was evacuated next. All personnel here were in 3037 and 3038. As the reaction causing the activity was still going personnel were sent back into Building approximately 5:02 with chemox masks to stop it. This was done by turning water on A-1 jacket and condenser coil at 2nd level of the building. The reaction was controlled and off gas recovered within about ten minutes of the initial burst. Road blocks were established next at the west end of the tank farm running north from White Oak Avenue. (These blocks were later moved in to the N. E. sector bounded by Central and Fourth Street). All evacuees were warned to move west. At about this time (approximately 5:20) it had been determined that 3550, 4500, 4501 and 4505 were not involved and these people advised that they could remain in their buildings but to be ready to leave.

Down wind from the scene (N. E. of 3026) happenings were approximately as follows. The Guard Department dispatcher was instructed to evacuate Post #16, LITER, and 3010 by telephone at approximately 5:04. While receiving the above by radio, the LITER called in to find a H. P. man. The LITER was appraised of the spill problem. Immediately thereafter one of the 3010 personnel appeared at the Control Room also in search of H. P. aid. He was told of the problem and asked if any people remained in 3010. None remained. The LITER was down and evacuated at 5:15, and it is assumed that the 3010 group were out by about 5:10. Unfortunately no early attempt was made to evacuate 3025. One person here evacuated when hearing the air monitors. One person remained downstairs out of earshot of the monitors and was not evacuated until 6:00. He received no known exp.

At approximately 6:00 M. E. Ramsey, H. Blauer and shortly thereafter, Dr. Larson were appraised of the difficulty. Upon arrival of 3026 supervision a break was taken for food. Thereafter, efforts were made to decontaminate 3026 cell block by directing a gentle flow of water down from above, and area and building investigation started. Upon suggestion of 3026 supervision, 4-12 janitors were held and a driver called in to spray the roads on 12-8 shift.

Unfortunately several incidents were noted that could not be considered the best from an emergency standpoint. First, although the LITER has numerous CAM's, the general attitude toward them is one of mistrust. Also, at the time of this incident, no gas masks were available here. At Building 3010 the situation was

the same regarding masks. Here the initial burst of radiation shut down the reactor and trouble at the LTR was suspected. First report from here indicated that their CAM was disconnected. (This has since proven wrong). However, as best can be determined information of air activity, here, was gotten from outside rather than building instruments. Still further regarding this group, a minor stir was created when one member upon reaching the canteen waving a cutie-pie advised evacuation. The entire group, one heavily contaminated, then proceeded to the Dispensary to contact the L. S. S. for aid.



---

W. M. Stanley

# INTER-COMPANY CORRESPONDENCE

OAK RIDGE NATIONAL LABORATORY

Operated By

CARBIDE AND CARBON CHEMICALS COMPANY

Post Office Box P  
OAK RIDGE, TENN.

(INSERT NAME) COMPANY \_\_\_\_\_ LOCATION \_\_\_\_\_

TO M. E. Ramsey  
LOCATION Building 4500

DATE May 10, 1954

ANSWERING LETTER DATE

ATTENTION  
COPY TO A. M. Weinberg  
K. Z. Morgan  
A. F. Rupp

SUBJECT 3026-D Incident of April 29, 1954

At 4:58 p.m. on the afternoon of April 29, 1954, a radiation incident occurred in Building 3026-D, which necessitated a partial evacuation of the Laboratory and which contaminated a considerable area north and northeast of the building. An account of the events just prior to and after the incident are as follows:

At about 4:56 p.m. (estimated) one of the operators on duty in Building 3026-D went to the third level (top) of the process cell, started addition of nitric acid to the dissolver, and went back to the second level (instrument panel). Upon the acid contacting the material in the dissolver (uranium slugs), a violent reaction occurred. It is now believed that the material, more active than usual, was thermally hot. The reaction forced hot solution and vapor from the slug chute and solution addition lines to the top of the cell block. As this occurred, air monitors and monitors within the building began to alarm. All personnel in the building donned gas masks and evacuated immediately.

As process and laboratory personnel emerged from the building the shift Guard Captain was in his car immediately across the street. Seeing the hasty exit and the orange fumes escaping from upper windows, the captain radioed immediately for the Health Physics Supervisor and the Laboratory Shift Supervisor. The time, established from recorded radio transmission, was 4:58 p.m. The H.P. man and the ISS arrived in approximately three minutes, or at 5:01 p.m. The incident was discussed and the fact that the dissolver cooling water was off and that most of the acid was in the dissolver was established. The 3026-D supervisor and one of his men re-entered the building immediately, wearing chemox masks and carrying 10 R Cutie-Pies. Water was turned on to the dissolver jacket to stop further reaction and prevent solidification of UH<sub>4</sub>. Before leaving the building it was observed that off-gas vacuum had been regained. This probably occurred when sufficient acid had run in to cool the material.

As this was being done, the Isotope Area was alerted and evacuated (six employees), as it seemed to be immediately down-wind. All evacuees were congregated up-wind from the scene and checked for contamination. At 5:03 p.m. Post 16, directly north of the scene, was evacuated and the guard sent to the west end of Building 3019. At about 5:06 p.m. Building 3550 was found unaffected and a check on Building 4500 was started. The actual situation in Building 4500 was not known until about 5:20 p.m.; however, events in between showed the wind to be more to the north. Word was given to the shift groups here, however, to alert them.

At about 5:08 p.m. the LITR called Guard Headquarters in search of a Health Physics man, and was told that the H.P. man was on an emergency at Building 3026. At 5:10 p.m. the Guard Dispatcher was instructed by radio to advise the LITR and Building 3010 to evacuate if their air monitors so indicated. The Dispatcher was also instructed at this time to close the East Portal and recall the guard there to headquarters. (This man was actually sent back to Building 4500 and posted at the east end). At the time of the above radio transmission the LITR was again in telephone contact with the Guard Dispatcher and overheard the transmission. He said he was evacuating. (It was later found that the LITR was evacuated at 5:14 p.m.). Directly after the above one of the 3010 men entered Guard Headquarters in search of Health Physics aid. He was apprised of the situation and asked if Building 3010 was evacuated. It had been, and a reasonable estimate of the time seems to be about 5:07 p.m.

The ISS was advised of the LITR and Building 3010 evacuations at 5:17 p.m. At 5:30 p.m. road blocks were established, blocking the northeast quadrant bounded by Central Avenue and Fourth Street. At about 5:40 p.m. Mr. N. Blauer, Chief Supervisor of Building 3026, was notified by telephone of the situation. At 5:43 p.m. AEC Patrol offered assistance with road blocks; this offer was declined with thanks. At about 5:50 p.m. Mr. M. E. Ramsey was advised of the situation, and shortly after 7:00 p.m. Dr. C. E. Larson was notified. At 6:00 p.m. the Graphite Reactor was shut down and evacuated. Although the air monitors were brought back on scale after the initial burst of activity, supervision in this building reported that they were not performing reliably. Shortly after 6:00 p.m. Mr. Blauer, Mr. E. J. Witkowski, and several representatives of Health Physics began to arrive. The situation as it existed was gone over and time taken for a bit of food.

Shortly after 7:00 p.m. more thorough surveys of contaminated areas were started. Also at this time efforts were started to reduce the activity on top of the 3026 process cell. This was done by lowering a forty-foot length of aluminum tube through an upper window to the cell top. Water was then directed at the spill through this tube. Within two hours this effort was discontinued, as no appreciable effect was gained.

By approximately 10:00 p.m. it had been determined that little more could be done at Building 3026, and that the most profitable course would be to emphasize checking and cleaning the contaminated area north and northeast of the release. To assist in this effort the evening shift janitor crew (16 men and a foreman) was held on the midnight shift, and a truck driver called in to operate the street cleaning truck. At about this time or earlier personnel re-checks and lists for special meter processing and urinalysis were started. All contaminated clothing not collected immediately following the incident was confiscated and replaced with Company clothing as necessary.

During the midnight shift the janitor crew mopped or wiped all horizontal surfaces in involved major buildings except in Buildings 3012 and 3026. The roads within the area were washed thoroughly with the wash truck. Although the above bettered the situation, it was found on the following day that considerable clean-up remained. At 8:00 a.m. on April 30 contamination in the buildings cleaned (3037, 3038, 3005, 3006, and 3010) was from 1 to 5  $\mu$ r/hr. Checks on water activity at White Oak Dam were started on the midnight shift and followed for increasing activity. At no time did the activity here become serious.

On Friday April 30, a general plan of attack was drawn. This involved 1) - restricting entry into the contaminated area, requiring shoe covers and yellow coveralls; 2) - restricting vehicular traffic in this area to hard surface roads (these were re-washed on Friday, April 30); 3) - scheduling personnel of affected groups, with janitorial and health physics help, on Sunday, May 2, for an organized decontamination effort; 4) - delaying any efforts at 3026-D until 8:00 a.m. on Monday, May 3. On Sunday, May 2, a total of 22 people other than shift personnel worked on clean up of the contaminated area; included were 11 departmental, 7 janitorial, and 4 health physics people. Approximately 6 shift people worked with them or upon their respective areas.

Going back and covering a bit more in detail the happenings in areas other than Building 3026-D at the time of the release, the following is found:

At Building 3010 the first indication of trouble was a reactor "scram". The first thought here was that the LITE had, by opening a hole or exposing a source, caused a radiation "scram". Air monitors here were not noted. Word of the condition reached them when one of their people called in to warn them. This man was at or near Post 16 at the time of the release, and at Post 16 when the guard was directed to move west. The time was 5:05 p.m. This man proceeded on foot to the Cafeteria, warning people here of high activity. He was in possession of a contaminated Cutis Pie. From here he proceeded to the Dispensary, where he was joined by others who had evacuated by truck. First contact with these people by the LSS was at the Dispensary. They were instructed to be extremely cautious of any contaminated clothing. Later conversation with the group indicated that air monitors were not noted and may have been shut off. It was established later that they were on and operating. It might be added that gas masks were not available here.

At the LITE, the initial release found the supervisor at Building 3001. Air monitors in open areas were off scale. The supervisor checked briefly for local trouble and called Guard Headquarters seeking H.P. aid at 5:08 p.m. It was determined that the air activity was general, Guard Headquarters was called again, and the building was evacuated upon overhearing radio transmission made at 5:10 p.m. The LITE was down at 5:14 p.m. and brought back up at 7:32 p.m. Here also no gas masks were available.

At 3001, the Graphite Reactor, the initial burst of activity was noted but the air monitors were brought back on scale by changing filters. This building remained occupied until 6:00 p.m., when the air monitors were not considered by supervision to be operating reliably. At this time the reactor was shut down; it was brought back up at 7:00 p.m.

At Building 3025, air monitors on the main floor sounded immediately after the release. The only man upstairs evacuated. At about 6:00 p.m. another man was discovered working in the basement of this building, out of earshot of the air monitors. He was evacuated at this time, and it was later found that he received a negligible exposure.

Generally, comparing radiation levels just following the incident\* and on Friday, May 7, we find the following:

	<u>5:00 p.m.</u> <u>April 29</u>	<u>4:30 p.m.</u> <u>May 7</u>
<b>Building 3026-D</b>		
First Level	750 mr/hr	100 mr/hr
Second Level	7-8 r/hr	150 mr/hr
Third Level (Spill area)	~ 100 r/hr	10-20 r/hr
<b>Roadways Northeast of 3026</b>	5-10 mr/hr	Below background
<b>Buildings Northeast of 3026</b>		
Exterior walls	10-20 mr/hr	< 1 mr/hr
Table tops, etc., inside	4-5 mr/hr	< 1 mr/hr (Only where decontaminated)
<b>Grass and Grounds Northeast of 3026</b>	10-15 mr/hr	4-5 mr/hr.

\* (Contamination levels in the involved area, except for Building 3026, were roughly the same as those experienced by the Laboratory from the Nevada bomb test fall-out in March 1953).

Personnel involved were in some cases contaminated to 40-50 mr, but were able to clean up reasonably well before leaving. Of those involved only five lost their personal clothing, and three more surrendered company clothing to Health Physics. A film meter survey of 123 people known to be in the plant showed that none received serious exposure. Similar results were indicated from thyroid counts and urinalyses taken only on those most closely involved.

W.M. Stanley (EK)  
Laboratory Shift Supervisor

WMS:bb

Shift men

10/6/23

Bring mine sample up to Kelly  
and hall for Walker to run  
over shift end -

POM

WJ

NK

Slide White Oak Point tunnel  
each shift over weekend - There  
is a bit of acid in water area each  
sample. Make results for Alce -

WJ

Run PDS samples constantly in  
3026-C/D because our monitors  
are not puncturing properly because  
of Carbonation

WJ

4-29-54

9-12

Guinn - Hubbard

4:53 pm

At ~ 5:15 pm this date while Acid  
was being added to dissolver in 3026-D all  
monitors & CAs suddenly began alarming.  
In a few seconds Acid fumes were noticed  
on the third level - At this point all  
personnel in 3026-D left the building -  
the following personnel were in 3026-D  
at the time of the incident: Dailey # 7566,  
Ferry # 7804, Hampton # 7676 and Bailey  
# 2387. Those named were extremely  
alert and resulted in very little  
over exposure at the time the  
incident occurred by leaving the  
building immediately.

POM

NK

5<sup>00</sup>PM

At ~ 5<sup>00</sup>PM very heavy acid fumes could be seen emerging from the top of 3026-D. No personnel were in the building at this time. Bailey # 2387 and Lampton # 7676 donned Chemox masks and entered the building to stop the flow of acid to the dissolver. Guinn # 9621 donned an Assault mask and entered 3026-C and found all CAMS on 20-k scale & all monitors alarming. An H.P. check of 900 Area revealed all CAMS & monitors alarming. At this same time 3001, LTR & 3010 reported all CAMS alarming. Building 3550, 3505, tank farm Area and the BB Shop CAMS were all normal or only showing slight activity - two Air samples were run at this <sup>time</sup> along the road south of 3026-D and little indication of Air activity was noted - the Background in the Road south of 3026-D at ~ 5<sup>25</sup>PM was about 500 <sup>u/hr</sup>. Readings taken on the first level of 3026-D at this time were ~ 800 <sup>u/hr</sup> the third level read greater than

10<sup>u/hr</sup> - 5<sup>15</sup>PM

By 5<sup>25</sup>PM All personnel had been evacuated in the Isotope Area and together with personnel from 3026-D

111  
5:15 PM

North of building 3515. By 5<sup>20</sup> PM all personnel in 3001, 3005, and 3010 had also left their respective areas.

At 6 PM H.P. was requested at medical to check Hungenford # Love #8088, HENRY #2189 Dailey # 7566 + Kirby # 1349. All these individuals had several pieces of contaminated clothing which became contaminated while in 3010 - All contaminated items were confiscated. these items left AT bldg. 2012-

Briley # 2387 + Lampton # 7676 became contaminated to ~ 100 mV/hr after entering 3026-D. they were cleaned up almost immediately-

S.H. Duke # 1451 and P.R. Sellers # 6099 of the guard dept were checked and all their outer clothing was confiscated. Lt. Bean # 1456 and H.L. Walker # 1502 of the guard dept were found with shoes reading above tolerance. Both cleaned their shoes to tolerance-

R.D. Hulén # 1877 was found with a contaminated shirt and it was confiscated.

By ~ 7 PM it was determined that the following places were contaminated: 3005, 3006, 3004, 3010, 3012, 3550, 3000 (substation), entire Isotope Area, and low some contamination in and around 3001, 3025 and Post #16 Guard Shack. Also it was determined that the ground in

a general NE direction from 3026-D was contaminated to ~ 100  $\mu\text{Ci}/\text{hr}$  - Most of the buildings mentioned had spots leading to 10  $\mu\text{Ci}/\text{hr}$  with scattered spots to 30 or 40  $\mu\text{Ci}/\text{hr}$ .

Further checks confirmed our previous belief that nothing west of 3026-D was contaminated - the 9500 area was free of cont. -

A crew of janitors was put to work about 12 midnight and they brought the levels of contamination down - 3026-D was roped off and is still in a highly contaminated state -

A more complete and comprehensive report is being prepared to cover such items as, urinalysis reports, personal exposures, Air Contamination, decontamination progress, and activity level of White Oak Lake <sup>lake</sup>.

D. Hart  
1/4/53

A very heavy rain at ~ 7 PM probably cleared the streets etc. greatly -

Exposure records, Urinalysis reports, thyroid counts and a review of the entire 3026-D episode confirm our belief at the time of the incident that no one received a dosage high enough to cause any alarm as to that individual's health.

~~SECRET~~

ORNL  
Central Files Number  
55-1-211

RALA PRODUCTION - 1954

A. F. Rupp and E. J. Witkowski

CLASSIFICATION CANCELLED  
DATE AUG 8 1957 *W*  
For The Atomic Energy Commission  
*H. B. Canale*  
Chief, Declassification Branch



OAK RIDGE NATIONAL LABORATORY  
OPERATED BY  
CARBIDE AND CARBON CHEMICALS COMPANY  
A DIVISION OF UNION CARBIDE AND CARBON CORPORATION

UIC

POST OFFICE BOX P  
OAK RIDGE, TENNESSEE

This document contains information defined in the Atomic Energy Act of 1954 which, if disclosed, would be injurious to the national defense. Its disclosure of its contents in any manner to unauthorized persons is prohibited.

~~SECRET~~

~~SECRET~~

volume of  $K_2CO_3$  solution from 9 to 50 liters in an effort to avoid the incomplete reactions experienced in some previous runs.

**Extractor and Filter Rinse.** Product was left behind in the extractor tank and on the process filters after it was transferred from the extractor to the resin column feed tank. It is impossible to make complete transfers because the relatively small size of the feed tank limits the volume of solutions that can be used for cleaning out the large extractor tank.

**Fuming Nitric Acid Filtration.** The highest loss experienced in this step was incurred in run No. 55, the only run processed through cubicle No. 300; this cubicle has a product evaporator and filter of the old design, and it is believed that the high loss was caused by cracks in the filter resulting from fabrication difficulties.

**Product Evaporator Rinse.** Some product was left behind in the evaporator after the main portion of the product solution had been transferred to the shipping cone. The volume of water used for the dissolution and transfer of the product is limited by the size of the cone and is too small for an effective transfer. Attempts to wash the tank with more water and to transfer the water to the shipping cone after the first portion had evaporated resulted in higher losses from the cone into the off-gas line.

In addition to the losses determined by the analysis of waste solutions, it is estimated that more than 15% of the starting product was lost through the off-gas line during the drying operation in the shipping cone. The largest single loss occurred in run No. 55. Since ORNL does not have the facility for making a radiochemical analysis of the product after it is put in the drying cone, such an analysis was made at Los Alamos; their analysis was lower by 20,000 curies than the measurement made at ORNL after the fuming nitric acid step.

#### UNUSUAL INCIDENTS

The equipment was operated far above its designed capacity (500 curies in dissolver and extraction section and 10,000 curies in the purification section) in every run. This condition led to the most serious accidental release of activity ever experienced in the history of the process, which made it necessary to abandon a run and to shut down the building for decontamination for a period of 11 weeks.

The slugs loaded into the dissolver for this run contained approximately 100,000 curies of product. The quantity of starting material was unusually large so that a very large shipment could be produced and so that the chance of a poor shipment resulting from losses caused by the usual processing difficulties could be reduced. It was planned to make the run in two parts and two separate shipments.

Dissolvings for the first part were discontinued after the third batch, instead of after the fourth batch as had been planned, because the UNH analysis showed that the slugs contained more than the expected amount of activity. The partially dissolved uranium slugs left in the dissolver therefore were hotter than in any previous run. The incident occurred at the beginning of the addition of 60%  $HNO_3$  for the second part of the run. Because of their intense radioactivity, the slugs apparently had become very (thermally) hot during the period of time that they were not covered with liquid between the dissolvings for the two parts of the run and had reacted violently with the  $HNO_3$ . The solution containing the radioactivity was blown into the operating area through the slug chute and the solution addition lines.

Following the incident, the radiation levels in the RaLa building itself were too high to permit entrance for effective decontamination. Work was started after the short-lived activity was allowed to decay for a period of ten days. Several other Laboratory areas north of the RaLa building were also contaminated, principally with short-lived iodine. Fortunately, the incident occurred during the 4-12 shift, when these areas were not occupied; by the use of emergency crews, most of the contamination was cleaned up before personnel reported for work at 8:00 AM the next day.

The incident caused a great deal of inconvenience in Laboratory operations and some lost time, but there was no serious overexposure of Laboratory personnel. The operators who were in the most vulnerable position at the time of the accident were quick to recognize the hazard and to protect themselves, being well practiced because of the frequent use of the RaLa emergency procedures.

As a result of this incident and of the frequent hazards encountered in the production of the large batches of RaLa, Los Alamos was requested to review its requirements and to reduce the number

and size of the batches requested, if possible. An agreement was reached that the Laboratory will attempt no more double runs and that only four runs per year will be made. It is believed that the new schedule will substantially reduce the operating hazards.

Direct pipe connections between the process vessels in the cells and the operating area (which are considered by the Operations Division to be obsolete design) were responsible for several other backups of activity into the operating area. The most serious of these occurred during run No. 55, in January, when activity backed up to the operating panel board through a steam line servicing a jet in cell A. While an attempt was being made to decontaminate the line with steam, a small valve at the steam pressure gage failed and activity was blown into the operating area. The building was contaminated, and two operators received some radiation overexposure - fortunately, not a serious amount.

General air contamination that was experienced through a large portion of the Laboratory on three occasions during two of the three successful runs was attributed to the RaLa operations; however, there is a good possibility that some of this air activity came from the experimental reactor area. The condition was presumably caused by a high discharge from the stack; in one case the caustic line to the dissolver off-gas scrubber plugged, and in another case, during an atmospheric inversion, the scrubbers operated normally but not effectively enough.

#### EQUIPMENT

The equipment used for the production of RaLa has always been operated far above its design capacity; changes to allow for higher levels of production were made only in the final purification stages, and they were inadequate for very large batches. The last alterations in the final purification equipment were made in order to produce 10,000-curie batches; however, before the equipment was completed, a new goal of 30,000 curies was set, and 50,000-curie batches were actually produced. Operation at these very high radiation levels has materially increased the hazards, and the equipment has deteriorated over a period of years.

It was decided several years ago that it would not be practical to further alter the equipment to increase the capacity, and a proposal to build

new, adequate facilities was submitted to the Atomic Energy Commission. However, it was decided this year to build the new plant at Arco; the new plant is expected to be in operation by July 1, 1956, and the existing RaLa plant will be permanently shut down at that time.

Maintenance of the equipment has continued to be difficult and expensive. For long-term operations, it would be more practical to replace or to rebuild some parts than to make the excessive repairs that would be needed. However, since the present plans are to produce only six more batches, no replacement of equipment or rebuilding will be done except where absolutely necessary.

The only major maintenance job undertaken this year was to rebuild one of the cubicles which hold the ion-exchange equipment. This was necessary because of a leak in the product evaporator thermocouple well and the failure of the sampling valves. The evaporator was replaced by one of a greater capacity and of an improved design that permits much closer control of the evaporation operation.

The RaLa equipment at the present time is in only fair condition. The cell A transfer lines are known to have many leaks, and the thermocouples in the dissolver have been inoperable for years. Decontamination and repairs in this cell are inadvisable and will not be done unless some major piece of equipment fails completely. The high level of contamination on the concrete walls and floor would require the removal of a large quantity of highly radioactive concrete, and it would be impossible to complete the work fast enough to meet the Los Alamos schedule. Also, a major decontamination job in this cell would be very expensive and would require a great deal of radiation exposure to operating and maintenance personnel. It is hoped that this work can be avoided, since RaLa operations at the Laboratory are to be permanently discontinued.

The main operating difficulties with the purification equipment are the erratic operation and the frequent failure of the sampling plug valves; both conditions are caused by the deterioration of the Teflon seats.

It is believed that one more decontamination of one of the cubicles will be required to complete the last six runs scheduled at the Laboratory.

#### PROCESS IMPROVEMENTS

Several important changes were made in the process this year. One was the addition (to the

~~SECRET COVER SHEET~~

X-26 (Revised 1-52)

OAK RIDGE NATIONAL LABORATORY  
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CARBIDE AND CARBON CHEMICALS COMPANY



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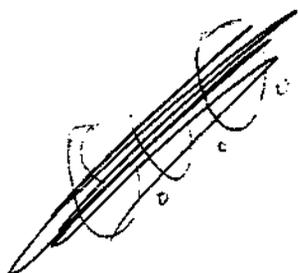
POST OFFICE BOX P  
OAK RIDGE, TENNESSEE

ORNL  
CENTRAL FILES NUMBER  
54-6-45

DATE: June 2, 1954  
SUBJECT: RALA PRODUCTION  
TO: K. A. Kasschau  
FROM: C. E. Larson

JUN 6 1954

This document consists of 3 pages.  
Copy 5 of 9 copies. Series A



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- 1-3. K. A. Kasschau
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~~SECRET COVER SHEET~~

  
OAK RIDGE NATIONAL LABORATORY  
OPERATED BY  
CARBIDE AND CARBON CHEMICALS COMPANY  
A DIVISION OF UNION CARBIDE AND CARBON CORPORATION



POST OFFICE BOX P  
OAK RIDGE, TENN.

June 2, 1954

U. S. Atomic Energy Commission  
Post Office Box E  
Oak Ridge, Tennessee

Attention: Mr. Kenneth A. Kasachau

Subject: KALA PRODUCTION

Gentlemen:

Kala run No. 56, which was started on April 25, had to be discontinued because of the release of radioactive gases caused by an abnormally vigorous reaction in the dissolver. The Kala processing building was contaminated and the gases were carried northward by a light breeze contaminating buildings in that area with 22-hour  $I^{133}$  and 8-day  $I^{131}$ . This occurred at about 4:58 p.m. April 29; immediate decontamination and isolation procedures were applied in the affected areas during the night so that areas other than actual operating building were in fairly good shape by morning.

During the period of this emergency, personnel were evacuated from the affected areas, radiation surveys made, and all necessary safety precautions taken. No serious radiation exposures or internal dosage of radioactivity were sustained by personnel; a few radiation exposures higher than normal were sustained by personnel in the operating area resulting from emergency measures taken after the "fume-off" occurred, rather than from direct operating exposure. These exposures were largely to supervisors who directed and actually performed most of the emergency work.

In searching for the reason for this occurrence, the first question asked is whether there was an operational error. From the standpoint of standard operating procedures, this can be answered negatively, since the same operating procedure has been used for the past ten years. To answer more fully, one must review at least a part of Kala history. The original Kala plant was designed and built to produce 500 curies of Kala per batch on a relatively short-term basis. During the years, there has been a steady increase in demand: 1,000, 5,000, 10,000, and then 30,000 curies per run.

*J. S. Morgan 1-31-95*

RECORDED - 104

June 2, 1954

Indeed, in the previous successful run, over 65,000 curies were shipped in two batches. At the 30,000 curies level, this represents an increase in production of over 60 times the designed capacity of the plant! It is true that the finishing section of the plant was rebuilt in 1950 to increase the capacity to 10,000 curies (immediately increased to 30,000 curies), but the primary dissolving and precipitation sections of the plant have never been changed.

As a consequence of inadequate equipment capacity, it is necessary to dissolve the metal for these big runs in batches instead of all at one time, as should be done. In addition to this, time and corrosion have taken their toll, and the thermocouples in the dissolver have long since been gone. Repairs are not possible because the cell cannot be entered, and decontamination would be extremely difficult because of the disintegrating, heavily contaminated concrete walls and corroded, leaking equipment.

The recent "fume-off" occurred at the beginning of the addition of 60%  $HNO_3$  for the fourth dissolving of the second portion of the run. It is believed that the residual uranium metal was heated to an abnormally high temperature by absorption of its radiation during the waiting period (28 hours) between the third and fourth dissolvings. The warm uranium, the surface previously etched by the other dissolvings, reacted vigorously with the nitric acid, and gases were given off in too great a volume for the off-gas system to handle.

It is not unusual for various kinds of mishaps to occur during Rala runs, for the equipment is old and the design is that of the early days of the Project. Back-ups into exterior lines and contamination from sampling and product removal are frequent. The recent spreading of contamination was unusual in that gaseous radioactivity was released containing short-lived iodine which is absorbed on dust, almost any kind of surface, grease, oil, paint, etc. Therefore, it was not possible to limit the spread of contamination to the operating building itself.

It is fortunate that virtually all of the contaminating activity was short-lived radioiodine, since the rapid decay helped during decontamination and radioiodine is not as toxic as general fission product mixtures. The buildings and grounds over which the gas passed were contaminated to give radiation readings ranging from 0.5 to 20  $mr/hr.$  and averaging roughly 5 to 6  $mr/hr.$  As a comparison, the much more widespread contamination with neptunium and general fission products from the Nevada bomb test fall-out in March 1953 gave radiation readings of about 2  $mr/hr.$  This comparison is offered not to minimize the results of the recent Rala "fume-off," but rather to bring it into its true perspective.

It is not necessary to cite the many statements made to the AEC by the Laboratory, urging that a new Rala facility be built, either at ORNL or elsewhere, for the last letter to Carbide and Carbon Chemicals Company from the

June 2, 1954

AEC, March 14, 1954, "Review of Proposed Rala Production Plant for ORNL," recognizes this fact as indicated in that letter.

"The AEC is aware of the difficulties experienced by ORNL in current production of sources required by Los Alamos Scientific Laboratory. You may be assured that every effort will be made to hasten the date at which your antiquated production plant can be retired."

We request that only those Rala runs most urgently required by Los Alamos be made in the future and that increased emphasis be placed upon the early start-up of Rala production at Arco.

Very truly yours,

OAK RIDGE NATIONAL LABORATORY

C. E. Larson  
Director

CEL:AFR:bg

Distribution:

- 1-3. K. A. Kasschau
4. C. E. Center
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**APPENDIX 4A**

**AIRFLOW PATTERNS AT THE OAK RIDGE RESERVATION**

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## APPENDIX 4A

### AIRFLOW PATTERNS AT THE OAK RIDGE RESERVATION

#### 4-A.1 Air Flow Patterns at the Oak Ridge Reservation

The dispersion of contaminants in the atmosphere is influenced primarily by the prevailing winds, meteorology, and terrain conditions. Some of the key factors influencing the atmospheric dispersion of contaminants from X-10 are presented here to provide an understanding of the airflow patterns at the Oak Ridge Reservation. The discussion presented below is based on a review of several relevant documents (Holland, 1953; Gifford, 1953; Hanna et al., 1974; Nappo et al., 1978; Eckman et al., 1992; Porch et al. 1991).

The Oak Ridge Reservation is situated in the Southern Appalachian Valley between the Great Smoky Mountains (1800 m MSL, maximum elevation) on the east and the Cumberland Plateau (1000 m MSL, maximum elevation) on the west (Figure 4.A.1). The orientation of the valley is northeast-southwest in the vicinity of the Oak Ridge Reservation, and the valley floor slopes gently from the northeast to the southwest. Within the Southern Appalachian Valley, several smaller ridges and valleys run parallel to each other and to the larger valley. The Oak Ridge Reservation is located among these smaller ridges and valleys, where ridges rise to over 350 m MSL, and the valley floors are at elevations of 240 m MSL. The average distance between two adjacent ridges is roughly 1.6 km.

The influence of the topography on prevailing winds in the Oak Ridge Reservation, particularly for a mid-valley location consistent with the location of the X-10 site within Bethel Valley, can be clearly seen in the wind roses (Figure 4-A.2). The predominant wind direction has clearly shifted from a west-to-east orientation in the upper layers of the atmosphere to southwest-to-northeast and northeast-to-southwest directions in layers close to the surface. During the day, the wind direction is predominantly up-valley, from southwest to northeast, and during the night, it is predominantly down-valley, from northeast to southwest.

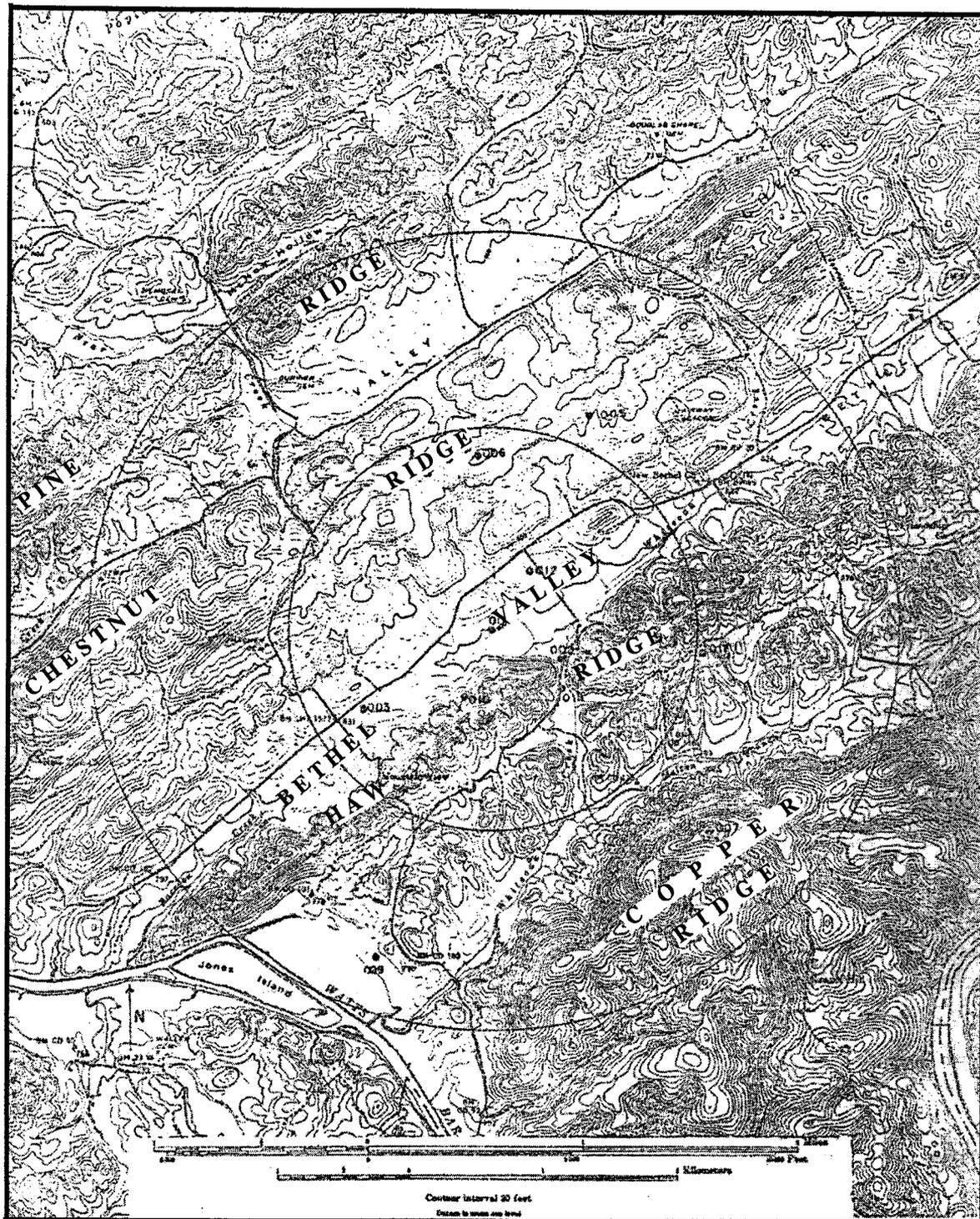


Figure 4-A.1 General topography of the region surrounding Oak Ridge.

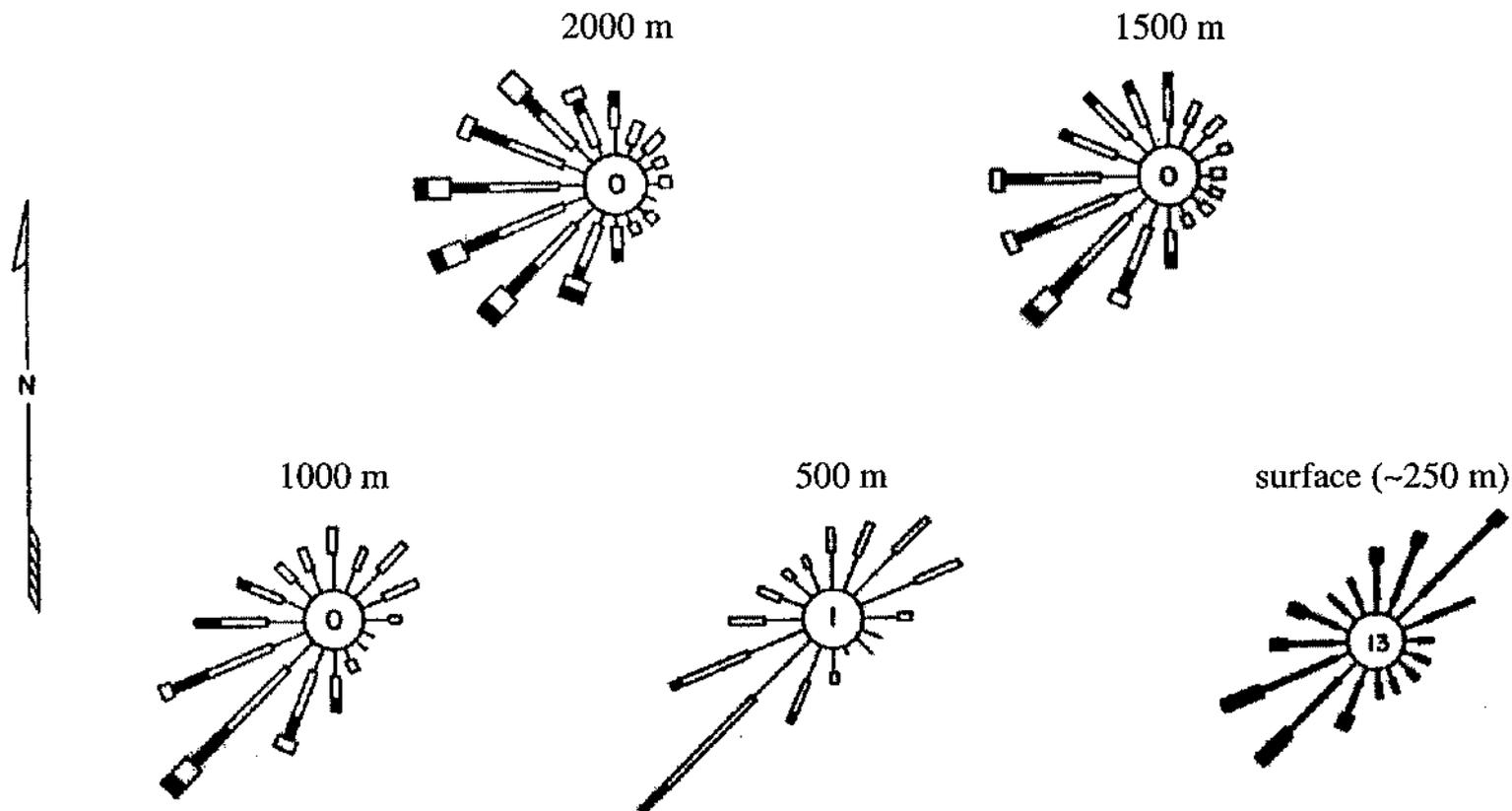


Figure 4-A.2 Wind roses at different elevations above mean sea level for a mid-valley location within the Bethel Valley.

The long, low ridges within the Oak Ridge Reservation are broken by several narrow gaps (e.g., the White Oak Gap in Haw Ridge, which separates Bethel and Melton Valleys). The flow near the White Oak Gap does not indicate that there is any exchange of air between the two valleys. During the day, flows from both sides converge at the gap, resulting in a flow that resembles the up-slope characteristics of typical daytime flow along the unbroken parts of Haw Ridge. During the night, flow on the Bethel Valley side of White Oak Gap resembles the downward drainage flows on other unbroken parts of Haw Ridge. The flow pattern within Bethel Valley in a vertical extent of up to 100 m from the valley floors is summarized in the schematic of Figure 4-A.3.

A study of the annual average wind rose from a 10-m monitoring station in the middle of Bethel Valley (Figure 4-A.4) reveals that there is always a significant air flow in a cross-valley direction. These cross-valley flow components at lower elevations represent the typical daytime up-slope and nighttime down-slope flow characteristics. In other words, these cross-valley components may not necessarily translate into flows from one valley to the next, consistent with the schematic in Figure 4-A.5. However, it must be recognized that under conditions of low wind speeds, cross-valley exchange of winds can occur over the ridges as indicated by the experiments conducted by Gifford (1953).

Gifford (1953) analyzed a series of experiments in which neutrally buoyant balloons were released and tracked during day and night and under light and strong wind conditions. His study indicated that under very light wind conditions, it is sometimes possible for a balloon released in one valley to rise above the ridges and travel to the ground in an adjacent valley with a simultaneous equidistant downwind (along-valley direction) transport. However, there were more cases in which the balloons would be caught in cross-valley, upper layer winds and travel several kilometers across several valleys without any descent. These two observations suggest that for locations of concern along cross-valley directions in valleys adjacent to the Bethel Valley, wind-speeds with low magnitudes are more important than those with larger magnitudes for the transport of contaminants.

The cross-valley exchange of air at low wind speeds across the ridge tops is a significant process for the analysis of dispersion across ridges. Since the predominant direction of wind flow in Bethel Valley is along the direction of the valley orientation, the frequencies of winds in cross-valley directions are lower than those for winds in the direction of valley orientation. However, if these cross-valley flows were dominated by winds of low magnitude, the movement of contaminants across the valley would be very slow, resulting in higher concentrations of contaminants along this flow path. Surface level winds in Figures 4A.2 and 4-A.4 in the cross-valley direction do seem to be dominated by winds of low magnitudes (up to a maximum of about  $3 \text{ m s}^{-1}$  from Figure 4-A.4).

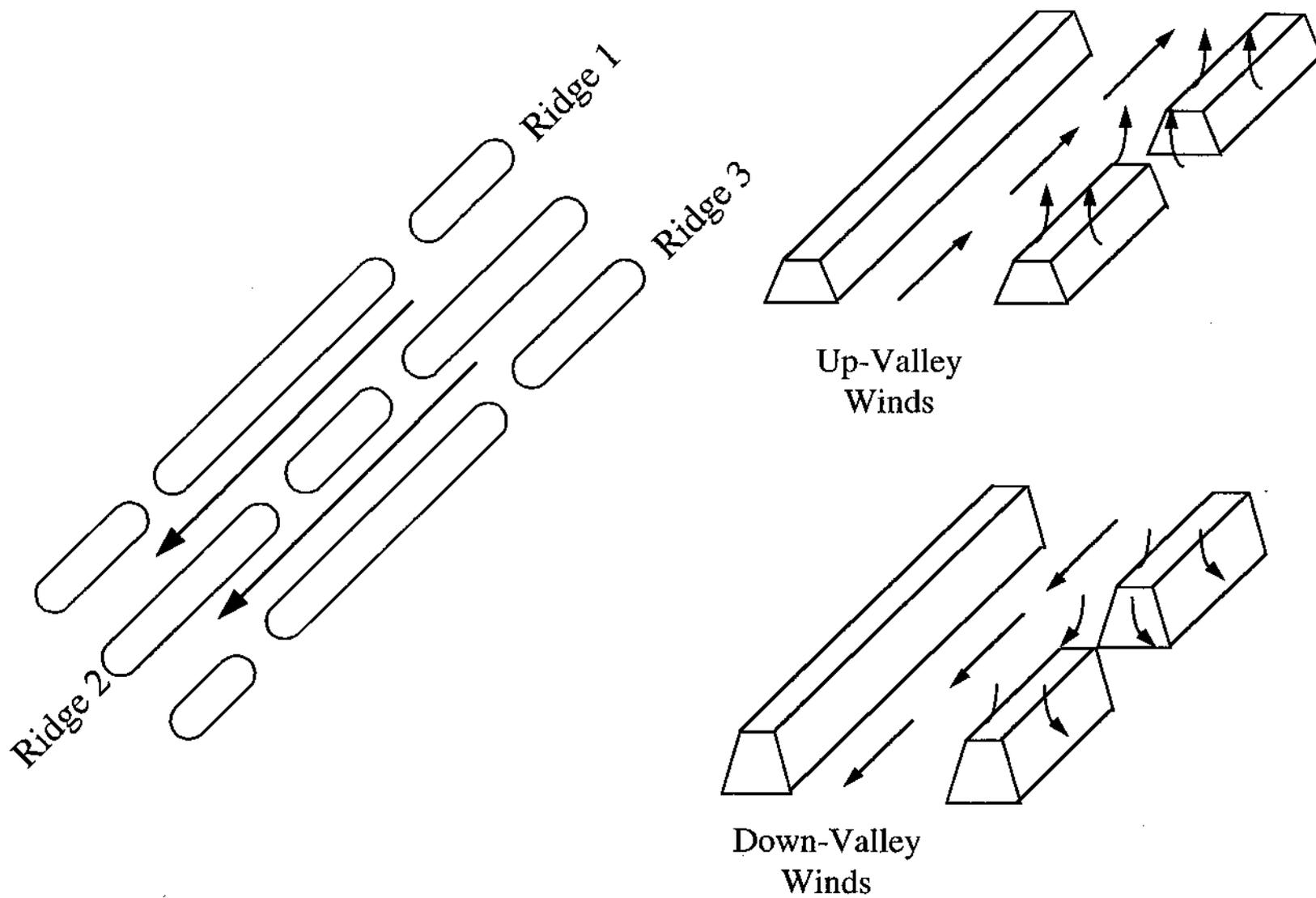


Figure 4-A.3 Flow patterns within the valley-ridge region surrounding the radioactive lanthanum processing facility.

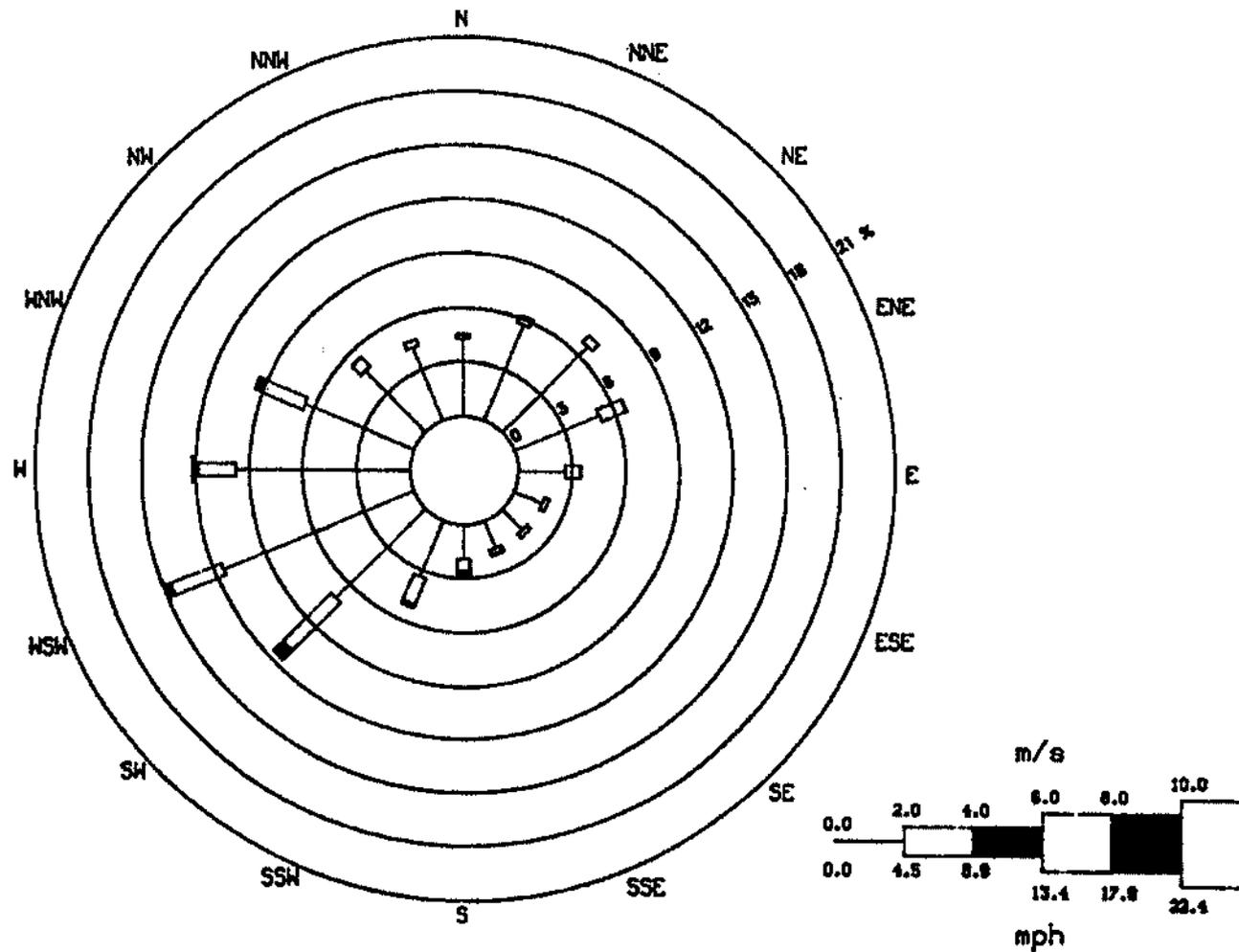


Figure 4-A.4 Annual wind rose for Tower C (at 10 m elevation) for 1993.

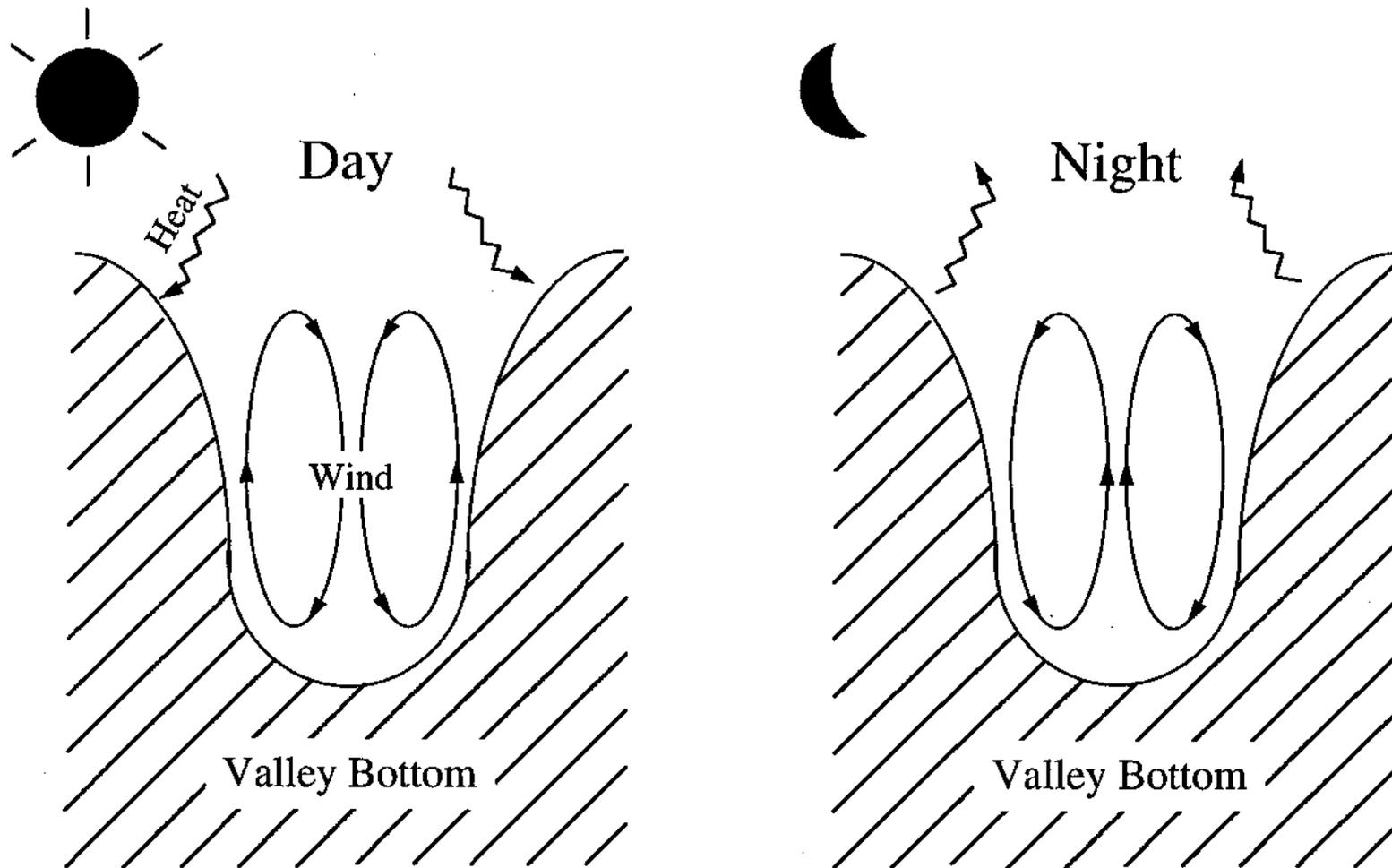


Figure 4-A.5 Cross-valley component of the mid-valley flow.

Because direct measurements at ridge-top levels from ridges adjacent to Bethel Valley are not available, it is not clear how much of the mid-valley winds of low magnitudes in cross-valley directions would translate into real cross-valley flows. Accurate quantification of the frequency and speed of winds across the ridges would, therefore, be a very difficult exercise requiring the establishment of correlations among meteorological parameters measured at mid-valley, up-slope, and ridge-top stations. After the establishment of correlations, a spatial and temporal distribution of the wind-field can be developed. However, such an exercise is clearly out of the scope of this study. Furthermore, it was determined very early in this study that the uncertainties in the estimates of doses and risks to individuals exposed to <sup>131</sup>I are dominated by contributions from processes other than the atmospheric dispersion of <sup>131</sup>I (e.g., dose-response relationship, internal dosimetry, and pasture-milk transfer coefficients). Therefore, it was decided to use an atmospheric dispersion model in this study that used the meteorology from a mid-valley location and validate the model using field data on releases and measured concentrations of <sup>131</sup>I. The results of the validation study, as shown in Section 4, clearly indicate that it was not necessary to account explicitly in the model for the effects of local terrain features.

#### 4-A.2 References

Eckman, R. M., Dobosy, R. J., and Pendergrass, W. R. "Preliminary Analysis of Wind Data for the Oak Ridge Site." NOAA/ATDD TM/ERL/ARI-193, 1992.

Gifford, F. A., Jr. "A Study of Low Level Air Trajectories at Oak Ridge," Tenn. Monthly Weather Review 18 (7):179-192. July 1953.

Hanna, S. R., Nappo, C. J., Hosker, R. P., and Briggs, G. A. "Description of the Eastern Tennessee Trajectory Experiment (ETTEX)." ATDL Contribution File No. 103. 1974.

Holland, J.Z. "A Meteorological Survey of the Oak Ridge Area: Final Report Covering the Period 1948-1952." NOAA/ATDD Report ORO-99. Oak Ridge, TN. 1953. (ChemRisk Repository No. 1211)

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Porch, W., Clements, W., Grant, T., and Coulter, R. "Comparison of Gap and Tributary Interactions with Nighttime Valley Flows from the ASCOT 1990 and 1988 Experiments." LA-UR-91-764, ASCOT-91-1. 1991.

**APPENDIX 10A**

**THYROID CANCER INCIDENCE DATA**

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## APPENDIX 10A THYROID CANCER INCIDENCE DATA

Exposure to radiation can increase a person's risk of getting thyroid cancer. Epidemiological evidence (Ron et al., 1995) shows that the increased risk of thyroid cancer depends on the background incidence of thyroid cancer of the population of interest, the gender of the exposed individual, and the age at the time of first exposure. The "background incidence" in this study is defined as the incidence in a population not exposed to <sup>131</sup>I released from X-10.

This appendix presents the thyroid cancer incidence data used in this study to estimate the excess lifetime risk of cancer from exposure to <sup>131</sup>I. Section 10-A.1 summarizes the background cancer incidence rates for the state of Tennessee. Section 10-A.2 describes the derivation of the "lifetime background" risk of thyroid cancer incidence, which is the quantity used to estimate the excess "lifetime" risk of thyroid cancer for an exposed individual (Section 10.2).

The background incidence of cancer in Tennessee exhibits two important properties: (a) large differences between people of different ethnic backgrounds, and (b) an increase with time during the last two decades. Sections 10-A.3 and 10-A.4 investigate the effect of these two properties on the final risk estimates reported in this study.

Individuals living in the state of Tennessee between 1951 and 1958 were exposed to <sup>131</sup>I from nuclear weapons testing performed at the Nevada Test Site (NTS). This exposure elevates their background incidence of cancer. In this study, a comparison is provided between the risk of cancer from exposure to <sup>131</sup>I released from X-10 and the risk of cancer from exposure to <sup>131</sup>I from NTS fallout. To estimate the risk from exposure to NTS fallout, the reported "background incidence" must be corrected for the contribution of NTS fallout. Section 10-A.5 describes the method used for this correction.

### **10A.1 Thyroid cancer incidence rates for the state of Tennessee**

The age-specific thyroid cancer incidence rates for Tennessee were provided by the Tennessee Department of Health in Nashville (Turri, 1998). These data are gender-specific, and they were provided in three geographical groups: (a) incidence rates for all Tennessee counties (Table 10-A.1), (b) incidence rates for Anderson, Roane, Loudon and Knox counties (Table 10-A.2), and (c) incidence rates for all counties in Tennessee other than Anderson, Roane, Loudon and Knox (Table 10-A.3.) The last data set was used for estimation of the background risk of thyroid cancer because it is considered to be specific for Tennessee areas while representing people that most probably were not exposed to <sup>131</sup>I released from the X-10 processing plant. Data were also separated by ethnic background into two categories (Tables 10-A.4 through 10-A.9): (a) whites, and (b) other races. In Tennessee, the category "other races" is dominated by individuals of African-American ethnic background.

Table 10-A.1 Thyroid cancer incidence data (1988 to 1995) for people of all races residing in the entire state of Tennessee (Turri, 1998).

FEMALES			
Age	Cases	Population <sup>a</sup>	Age-specific rate <sup>b</sup>
0-4	1	1,343,239	0.1
5-9	1	1,361,900	0.1
10-14	5	1,361,356	0.4
15-19	35	1,442,875	2.4
20-24	48	1,493,258	3.2
25-29	73	1,625,259	4.5
30-34	139	1,660,664	8.4
35-39	138	1,609,513	8.6
40-44	126	1,496,264	8.4
45-49	109	1,250,494	8.7
50-54	92	1,086,455	8.5
55-59	81	995,148	8.1
60-64	75	946,657	7.9
65-69	90	905,859	9.9
70-74	50	752,240	6.6
75-79	44	633,749	6.9
80-84	42	438,173	9.6
85+	24	368,431	6.5
<b>TOTAL</b>	<b>1173</b>	<b>20,771,534</b>	<b>5.6</b>
MALES			
0-4	1	1,407,329	0.1
5-9	1	1,433,174	0.1
10-14	2	1,431,410	0.1
15-19	1	1,524,739	0.1
20-24	8	1,486,906	0.5
25-29	27	1,572,468	1.7
30-34	37	1,569,621	2.4
35-39	31	1,524,145	2.0
40-44	34	1,422,288	2.4
45-49	37	1,186,734	3.1
50-54	47	1,006,636	4.7
55-59	31	882,440	3.5
60-64	31	803,538	3.9
65-69	28	714,163	3.9
70-74	23	535,913	4.3
75-79	20	385,733	5.2
80-84	9	219,069	4.1
85+	7	137,466	5.1
<b>TOTAL</b>	<b>375</b>	<b>19,243,772</b>	<b>1.9</b>

<sup>a</sup> Population figures are cumulative over 8 years (1988 to 1995).<sup>b</sup> per 100,000 per year.

Table 10-A.2 Thyroid cancer incidence data (1988 to 1995) for people of all races residing in Anderson, Roane, Loudon or Knox counties in Tennessee (Turri, 1998).

FEMALES			
Age	Cases	Population <sup>a</sup>	Age-specific rate <sup>b</sup>
0-4	0	121,686	0.0
5-9	0	124,646	0.0
10-14	0	122,781	0.0
15-19	3	140,737	2.1
20-24	6	155,847	3.8
25-29	11	158,567	6.9
30-34	17	164,111	10.4
35-39	20	161,154	12.4
40-44	9	151,206	6.0
45-49	10	126,497	7.9
50-54	10	109,351	9.1
55-59	9	102,613	8.8
60-64	11	101,703	10.8
65-69	13	99,415	13.1
70-74	6	80,648	7.4
75-79	2	67,460	3.0
80-84	6	46,095	13.0
85+	1	37,552	2.7
<b>TOTAL</b>	<b>134</b>	<b>2,072,069</b>	<b>6.5</b>
MALES			
0-4	0	127,229	0.0
5-9	0	129,014	0.0
10-14	0	129,187	0.0
15-19	0	146,073	0.0
20-24	1	158,469	0.6
25-29	1	152,329	0.7
30-34	5	156,404	3.2
35-39	2	152,216	1.3
40-44	4	141,904	2.8
45-49	6	120,584	5.0
50-54	9	101,430	8.9
55-59	4	88,818	4.5
60-64	2	83,861	2.4
65-69	2	75,865	2.6
70-74	1	55,631	1.8
75-79	4	38,945	10.3
80-84	1	21,643	4.6
85+	2	12,434	16.1
<b>TOTAL</b>	<b>44</b>	<b>1,892,036</b>	<b>2.3</b>

<sup>a</sup> Population figures are cumulative over 8 years (1988 to 1995).

<sup>b</sup> per 100,000 per year.

Table 10-A.3 Thyroid cancer incidence data (1988 to 1995) for people of all races residing in Tennessee counties other than Anderson, Roane, Loudon or Knox (Turri, 1998).

FEMALES			
Age	Cases	Population <sup>a</sup>	Age-specific rate <sup>b</sup>
0-4	1	1,221,553	0.1
5-9	1	1,237,254	0.1
10-14	5	1,238,575	0.4
15-19	32	1,302,138	2.5
20-24	42	1,337,411	3.1
25-29	62	1,466,692	4.2
30-34	122	1,496,553	8.2
35-39	118	1,448,359	8.1
40-44	117	1,345,058	8.7
45-49	99	1,123,997	8.8
50-54	82	977,104	8.4
55-59	72	892,535	8.1
60-64	64	844,954	7.6
65-69	77	806,444	9.5
70-74	44	671,592	6.6
75-79	42	566,289	7.4
80-84	36	392,078	9.2
85+	23	330,879	7.0
<b>TOTAL</b>	<b>1039</b>	<b>18,699,465</b>	<b>5.6</b>
MALES			
Age	Cases	Population <sup>a</sup>	Age-specific rate <sup>b</sup>
0-4	1	1,280,100	0.1
5-9	1	1,304,160	0.1
10-14	2	1,302,223	0.2
15-19	1	1,378,666	0.1
20-24	7	1,328,437	0.5
25-29	26	1,420,139	1.8
30-34	32	1,413,217	2.3
35-39	29	1,371,929	2.1
40-44	30	1,280,384	2.3
45-49	31	1,066,150	2.9
50-54	38	905,206	4.2
55-59	27	793,622	3.4
60-64	29	719,677	4.0
65-69	26	638,298	4.1
70-74	22	480,282	4.6
75-79	16	346,788	4.6
80-84	8	197,426	4.1
85+	5	125,032	4.0
<b>TOTAL</b>	<b>331</b>	<b>17,351,736</b>	<b>1.9</b>

<sup>a</sup> Population figures are cumulative over 8 years (1988 to 1995).<sup>b</sup> per 100,000 per year.

Table 10-A.4 Thyroid cancer incidence data (1988 to 1995) for white people residing in the entire state of Tennessee (Turri, 1998).

FEMALES-WHITE			
Age	Cases	Population <sup>a</sup>	Age-specific rate <sup>b</sup>
0-4	1	1029505	0.1
5-9	1	1056941	0.1
10-14	5	1062538	0.5
15-19	35	1137105	3.1
20-24	48	1188611	4.0
25-29	71	1312434	5.4
30-34	138	1343990	10.3
35-39	138	1318069	10.5
40-44	126	1258719	10
45-49	107	1069860	10
50-54	91	936518	9.7
55-59	80	865909	9.2
60-64	75	827761	9.1
65-69	88	795065	11.1
70-74	50	660648	7.6
75-79	44	556258	7.9
80-84	42	385588	10.9
85+	23	324004	7.1
<b>TOTAL</b>	<b>1163</b>	<b>17,129,523</b>	<b>6.8</b>
MALES-WHITE			
0-4	1	1083362	0.1
5-9	1	1117526	0.1
10-14	2	1123466	0.2
15-19	1	1213367	0.1
20-24	7	1204816	0.6
25-29	27	1301752	2.1
30-34	37	1312547	2.8
35-39	31	1289631	2.4
40-44	32	1229105	2.6
45-49	37	1043617	3.5
50-54	46	891205	5.2
55-59	31	788907	3.9
60-64	31	719272	4.3
65-69	28	638364	4.4
70-74	22	476731	4.6
75-79	20	340091	5.9
80-84	9	190639	4.7
85+	6	116854	5.1
<b>TOTAL</b>	<b>369</b>	<b>16,081,252</b>	<b>2.3</b>

<sup>a</sup> Population figures are cumulative over 8 years (1988 to 1995).

<sup>b</sup> per 100,000 per year.

Table 10-A.5 Thyroid cancer incidence data (1988 to 1995) for white people residing in Anderson, Roane, Loudon or Knox counties in Tennessee (Turri, 1998).

FEMALES-WHITE			
Age	Cases	Population <sup>a</sup>	Age-specific rate <sup>b</sup>
0-4		107837	
5-9		110210	
10-14		109185	
15-19	3	125086	2.4
20-24	6	139668	4.3
25-29	10	143580	7
30-34	17	148556	11.4
35-39	20	146912	13.6
40-44	9	139080	6.5
45-49	9	117375	7.7
50-54	10	101685	9.8
55-59	9	96408	9.3
60-64	11	95497	11.5
65-69	13	93575	13.9
70-74	6	75697	7.9
75-79	2	63232	3.2
80-84	6	43162	13.9
85+	1	35395	2.8
<b>TOTAL</b>	<b>132</b>	<b>1,892,140</b>	<b>7.0</b>
MALES-WHITE			
0-4		113129	
5-9		114546	
10-14		114909	
15-19		129987	
20-24	1	142756	0.7
25-29	1	139636	0.7
30-34	5	143656	3.5
35-39	2	141064	1.4
40-44	3	132540	2.3
45-49	6	112784	5.3
50-54	9	95706	9.4
55-59	4	83991	4.8
60-64	2	79721	2.5
65-69	2	71969	2.8
70-74	1	52719	1.9
75-79	4	36625	10.9
80-84	1	20208	4.9
85+	1	11458	8.7
<b>TOTAL</b>	<b>42</b>	<b>1,737,404</b>	<b>2.4</b>

<sup>a</sup> Population figures are cumulative over 8 years (1988 to 1995).<sup>b</sup> per 100,000 per year.

Table 10-A.6 Thyroid cancer incidence data (1988 to 1995) for white people residing in Tennessee counties other than Anderson, Roane, Loudon or Knox counties (Turri, 1998).

FEMALES-WHITE			
Age	Cases	Population <sup>a</sup>	Age-specific rate <sup>b</sup>
0-4	1	921668	0.1
5-9	1	946731	0.1
10-14	5	953353	0.5
15-19	32	1012019	3.2
20-24	42	1048943	4.0
25-29	61	1168854	5.2
30-34	121	1195434	10.1
35-39	118	1171157	10.1
40-44	117	1119639	10.4
45-49	98	952485	10.3
50-54	81	834833	9.7
55-59	71	769501	9.2
60-64	64	732264	8.7
65-69	75	701490	10.7
70-74	44	584951	7.5
75-79	42	493026	8.5
80-84	36	342426	10.5
85+	22	288609	7.6
<b>TOTAL</b>	<b>1031</b>	<b>15,237,383</b>	<b>6.8</b>
MALES-WHITE			
0-4	1	970233	0.1
5-9	1	1002980	0.1
10-14	2	1008557	0.2
15-19	1	1083380	0.1
20-24	6	1062060	0.6
25-29	26	1162116	2.2
30-34	32	1168891	2.7
35-39	29	1148567	2.5
40-44	29	1096565	2.6
45-49	31	930833	3.3
50-54	37	795499	4.7
55-59	27	704916	3.8
60-64	29	639551	4.5
65-69	26	566395	4.6
70-74	21	424012	5
75-79	16	303466	5.3
80-84	8	170431	4.7
85+	5	105396	4.7
<b>TOTAL</b>	<b>327</b>	<b>14,343,848</b>	<b>2.3</b>

<sup>a</sup> Population figures are cumulative over 8 years (1988 to 1995).

<sup>b</sup> per 100,000 per year.

Table 10-A.7 Thyroid cancer incidence data (1988 to 1995) for people of other races than white residing in the entire state of Tennessee (Turri, 1998).

FEMALES - Other races			
Age	Cases	Population <sup>a</sup>	Age-specific rate <sup>b</sup>
0-4		313734	
5-9		304959	
10-14		298818	
15-19		305770	
20-24		304647	
25-29	2	312825	0.6
30-34	1	316674	0.3
35-39		291444	
40-44		237545	
45-49	2	180634	1.1
50-54	1	149937	0.7
55-59	1	129239	0.8
60-64		118896	
65-69	2	110794	1.8
70-74		91592	
75-79		77491	
80-84		52585	
85+	1	44427	2.3
<b>TOTAL</b>	<b>10</b>	<b>3,642,011</b>	<b>0.3</b>
MALES - Other races			
0-4		323967	
5-9		315648	
10-14		307944	
15-19		311372	
20-24	1	282090	0.4
25-29		270716	
30-34		257074	
35-39		234514	
40-44	2	193183	1
45-49		143117	
50-54	1	115431	0.9
55-59		93533	
60-64		84266	
65-69		75799	
70-74	1	59182	1.7
75-79		45642	
80-84		28430	
85+	1	20612	4.9
<b>TOTAL</b>	<b>6</b>	<b>3,162,520</b>	<b>0.2</b>

<sup>a</sup> Population figures are cumulative over 8 years (1988 to 1995).<sup>b</sup> per 100,000 per year.

Table 10-A.8 Thyroid cancer incidence data (1988 to 1995) for people of other races than white residing in Anderson, Roane, Loudon or Knox counties in Tennessee (Turri, 1998).

FEMALES - Other races			
Age	Cases	Population <sup>a</sup>	Age-specific rate <sup>b</sup>
0-4		13849	
5-9		14436	
10-14		13596	
15-19		15651	
20-24		16179	
25-29	1	14987	6.7
30-34		15555	
35-39		14242	
40-44		12126	
45-49	1	9122	11
50-54		7666	
55-59		6205	
60-64		6206	
65-69		5840	
70-74		4951	
75-79		4228	
80-84		2933	
85+		2157	
<b>TOTAL</b>	<b>2</b>	<b>179,929</b>	<b>1.1</b>
MALES - Other races			
0-4		14100	
5-9		14468	
10-14		14278	
15-19		16086	
20-24		15713	
25-29		12693	
30-34		12748	
35-39		11152	
40-44	1	9364	10.7
45-49		7800	
50-54		5724	
55-59		4827	
60-64		4140	
65-69		3896	
70-74		2912	
75-79		2320	
80-84		1435	
85+	1	976	102.5
<b>TOTAL</b>	<b>2</b>	<b>154,632</b>	<b>1.3</b>

<sup>a</sup> Population figures are cumulative over 8 years (1988 to 1995).

<sup>b</sup> per 100,000 per year.

Table 10-A.9 Thyroid cancer incidence data (1988 to 1995) for people of other races than white residing in Tennessee counties other than Anderson, Roane, Loudon or Knox counties (Turri, 1998).

FEMALES - Other races			
Age	Cases	Population <sup>a</sup>	Age-specific rate <sup>b</sup>
0-4		299885	
5-9		290523	
10-14		285222	
15-19		290119	
20-24		288468	
25-29	1	297838	0.3
30-34	1	301119	0.3
35-39		277202	
40-44		225419	
45-49	1	171512	0.6
50-54	1	142271	0.7
55-59	1	123034	0.8
60-64		112690	
65-69	2	104954	1.9
70-74		86641	
75-79		73263	
80-84		49652	
85+	1	42270	2.4
<b>TOTAL</b>	<b>8</b>	<b>3,462,082</b>	<b>0.2</b>
MALES - Other races			
0-4		309867	
5-9		301180	
10-14		293666	
15-19		295286	
20-24	1	266377	0.4
25-29		258023	
30-34		244326	
35-39		223362	
40-44	1	183819	0.5
45-49		135317	
50-54	1	109707	0.9
55-59		88706	
60-64		80126	
65-69		71903	
70-74	1	56270	1.8
75-79		43322	
80-84		26995	
85+		19636	
<b>TOTAL</b>	<b>4</b>	<b>3,007,888</b>	<b>0.1</b>

<sup>a</sup> Population figures are cumulative over 8 years (1988 to 1995).<sup>b</sup> per 100,000 per year.

The differences in the risk estimates between the ethnic groups of African-Americans and European-Americans may be due to possible different dose-response relationships, as well as to different background incidence rates of thyroid cancer (Equation 10.1). To date, there is no established *radiation dose - thyroid cancer* relationship for African-Americans. If the available dose-response relationship (Ron et al., 1995) is valid for both blacks and whites, the differences in the risk estimates will be due only to the differences in the background incidence rates.

### 10A.2 Derivation of the lifetime "background" risk of thyroid cancer incidence

An individual of age "i" has a baseline risk of getting thyroid cancer during his or her remaining life. This baseline risk is called "lifetime background risk," and it depends on the age "i," and on the life expectancy of the individual. In this study, the exposed individual is an average individual having an average lifetime of 70 years. Also, by definition, the individual has no thyroid cancer at age "i."

The lifetime background risk of thyroid cancer for an individual can be estimated as follows:

#### In the case of exposure to radiation at age "i"

Let  $R_{o,k}$  be the incidence rate of thyroid cancer for a nonirradiated population of age  $k$  (new cases per 100,000 per year); this quantity is known as the background risk of thyroid cancer. Let  $R_{l,k,i}$  be the excess incidence rate of thyroid cancer for a population of age  $k$  exposed to a dose  $D$  at age  $i$ ; that is,  $R_{l,k,i}$  represents the excess incidence rate produced by the radiation only (new cases per 100,000 per year). The total incidence rate of thyroid cancer  $R_k$  for a population of age  $k$  is given by

$$R_k = R_{o,k} + R_{l,k,i}$$

For an individual exposed to a dose  $D$  at age  $i$ , the probability of surviving through age  $k$  without a thyroid cancer can be expressed as:

$$L_k = L_{k-1} \cdot (1 - R_k \cdot Dt) \quad k = i+1, i+2, \dots$$

To attain age  $k$  without acquiring a thyroid cancer means attaining age  $k-1$  with no thyroid cancer ( $L_{k-1}$ ) and getting no cancer in year  $k$ . The individual is assumed to have had no thyroid cancer before the age  $i$  when exposure takes place, thus  $L_i = 1$ . The time step for which incidence of thyroid cancer is detected is  $\Delta t = 1$  yr.

For an individual exposed to a dose  $D$  at age  $i$ , the probability of acquiring a thyroid cancer at age  $k$ , for any reason, can be expressed as

$$T_k = L_{k-1} \cdot (R_k \cdot Dt) \quad k = i+1, i+2, \dots$$

Moreover, for the same individual, the probability of acquiring a **radiation-induced** thyroid cancer at age  $k$  is:

$$TRI_k = L_{k-1} \cdot (R_{l,k,i} \cdot Dt) \quad k = i+1, i+2, \dots$$

Thus, the lifetime probability of acquiring a **radiation-induced** thyroid cancer (or the excess lifetime risk (*ELR*) of thyroid cancer for an individual exposed to a dose *D* at age *i*) can be written as

$$\begin{aligned}
 ELR(D_i) &= \sum_{k=i}^{\max \text{ age}} L_{k-1} \cdot (R_{1,k,i} \cdot \Delta t) \\
 &= \sum_{k=i}^{\max \text{ age}} \{1 \cdot [1 - R_1 \cdot \Delta t] \cdot [1 - R_2 \cdot \Delta t] \cdot \dots \cdot [1 - R_{k-1} \cdot \Delta t]\} \cdot (R_{1,k,i} \cdot \Delta t)
 \end{aligned}
 \tag{Eq.10-A.1}$$

The risk of acquiring thyroid cancer from exposure to a radiation dose *D* can be expressed by a linear relative model (Ron et al., 1995)

$$R = R_0 \cdot h = R_0 \cdot (1 + \mathbf{b} \cdot D)$$

where

<i>R</i>	=	total risk;
<i>R</i> <sub>0</sub>	=	background risk;
<i>h</i>	=	dose-response function;
<b><i>b</i></b>	=	excess relative risk per unit dose; and
<i>D</i>	=	radiation dose.

Using this model, one can identify

$$R - R_0 = \text{the excess (absolute) risk (EAR)}$$

$$(R - R_0)/R_0 = \text{the excess relative risk (ERR)}$$

$$\mathbf{b} = (R - R_0)/(R_0 D) = \text{the excess relative risk per unit dose.}$$

Further, assuming a linear dependence of the dose-response function, the incidence rate of radiation-induced thyroid cancer can be written as:

$$\begin{aligned}
 R_{1,k,i} &= 0 && \text{for } i \leq k < i + 5 \\
 &= R_{0,k} \cdot \mathbf{b}_i \cdot D_i && \text{for } k \geq i + 5
 \end{aligned}$$

This expression is based on experimental evidence (Ron et al., 1995) suggesting that (a) there is no observed effect in the first 5 years after the exposure, and (b) the radiation-induced thyroid cancer rate is proportional to the exposure dose (*D*) and to the background rate (*R*<sub>0, *k*</sub>) at the age of interest (*k*). The proportionality constant (***b***) is assumed to depend only on the age at exposure (*i*).

The excess lifetime risk (*ELR*) of thyroid cancer after an exposure at age *i* can be computed using Equation 10-A.1. The terms  $(1-R_k \mathbf{D})$  are less than but very close to 1, because the incidence rates  $R_k$  are less than  $10^{-2}$  per year. Thus, a good approximation for estimating *ELR* is

$$\begin{aligned} ELR(D_i) &\cong \sum_{k=i}^{lifetime} (R_{1,k,i} \cdot \Delta t) = \sum_{k=i}^{lifetime} (R_{0,k} \cdot \mathbf{b}_i \cdot D_i \cdot \Delta t) \\ &= \mathbf{b}_i \cdot D_i \cdot \sum_{k=i}^{lifetime} (R_{0,k} \cdot \Delta t) = \mathbf{b}_i \cdot D_i \cdot B_i \end{aligned} \quad (\text{Eq.10-A.2})$$

where  $B_i$  = the lifetime background risk of thyroid cancer from an exposure at age *i*.

Equation 10-A.2 will always indicate a larger risk than equation 10-A.1, but the relative difference is less than 10% for doses of about 500 rad, and less than 1% for doses of about 50 rad.

From Equation 10-A.2, the quantity  $B_i$  (called "lifetime background risk of thyroid cancer") is calculated as

$$B_i = \sum_{k=i}^{lifetime} (R_{0,k} \cdot \Delta t) \quad (\text{Eq.10-A.3})$$

where  $R_{0,k}$  = the age-specific thyroid cancer incidence rate for age "k."

#### In the absence of exposure to radiation

In this case, the lifetime risk of acquiring (thyroid) cancer for an individual at age *i* is given by the probability of attaining age *i* without contracting a cancer (or dying from some other cause), and by the probability of contracting cancer in the years following age *i*.

$$\begin{aligned} B_i &= \sum_{k=i}^{\max \text{ age}} L_{k-1} \cdot (R_k \cdot \Delta t) \\ &= \sum_{k=i}^{\max \text{ age}} \{ [1 - R_1 \cdot \Delta t] \cdot [1 - R_2 \cdot \Delta t] \cdot \dots \cdot [1 - R_{k-1} \cdot \Delta t] \} \cdot (R_k \cdot \Delta t) \end{aligned} \quad (\text{Eq.10-A.4})$$

Again, the terms  $(1-R_k \mathbf{D})$  are less than but very close to 1, because the incidence rates  $R_k$  are less than  $10^{-2}$  per year. Thus, an approximation of the lifetime risk of acquiring cancer from natural causes for an individual of age *i* is

$$B_i = \sum_{k=i}^{lifetime} (R_k \cdot \Delta t) = \sum_{k=i}^{lifetime} (R_{0,k} \cdot \Delta t) \quad (\text{Eq.10-A.5})$$

In this case,  $R_k = R_{0,k}$ , because no exposure to radiation occurred. Equations 10-A.3 and 10-A.5 are identical.

### **10A.3 Influence of ethnic background on the estimates of thyroid cancer risk**

The racial differences in the thyroid risk estimates (if any) are given by possible different dose-response relationships and by different background incidence rates of thyroid cancer (Equation 10.1) between blacks and whites. To date, there is no dose-response relationship determined for thyroid cancer in blacks. Assuming that the available dose-response relationship (Ron et al., 1995) would apply the same to both blacks and whites, the differences in the risk estimates will be due only to the differences in the background incidence rates.

Data collected across the United States (Figure 10-A.1) show that blacks have a lower incidence of thyroid cancer than do whites. This difference seems to be more pronounced for people in the state of Tennessee. However, when analyzing the statistics for blacks in the state of Tennessee, one must keep in mind the very low number of observed cases between 1988 and 1995: 6 for males and 10 females over the entire state, including 4 for males and 8 for females in all counties in Tennessee other than Anderson, Roane, Loudon and Knox counties (Tables 10-A.4 through 10-A.9; Figure 10-A.2).

Because of the low number of thyroid cancer cases for blacks, a "lifetime" background incidence of cancer ( $B_i$ ), cannot be estimated. However, this quantity can be estimated for whites only, and then compared to the estimate for a population formed of all races (currently used to produce the risk estimates presented in this report). The estimates are made using the method presented in Section 10-A.2. The background for whites is larger than the background for all races combined by about 18 to 19% for females and by 14% for males. That is, if risk estimates were produced for the white population only, the current risk estimates would increase by 19% for females and by 14% for males.

Since the "lifetime" background incidence of cancer cannot be estimated for blacks, a rough estimate of the change in the risk estimate can be obtained using the total number of people in the area of interest (i.e., all counties in Tennessee other than Anderson, Roane, Loudon and Knox). For females, these numbers (summed from 1988 to 1995) are (a) 15,237,383 white females, (b) 3,462,082 black females, and (c) 18,699,465 females of all races. Given that the background for white females is larger by only 19% than the background for females all races ( $4.61 \times 10^{-3}$  versus  $3.88 \times 10^{-3}$ ), the background for black females must be about 16 times lower than the background for females of all races combined. That is, the risk estimates for black females should be a factor of 16 lower than the risk estimates for females of all races reported in this study.

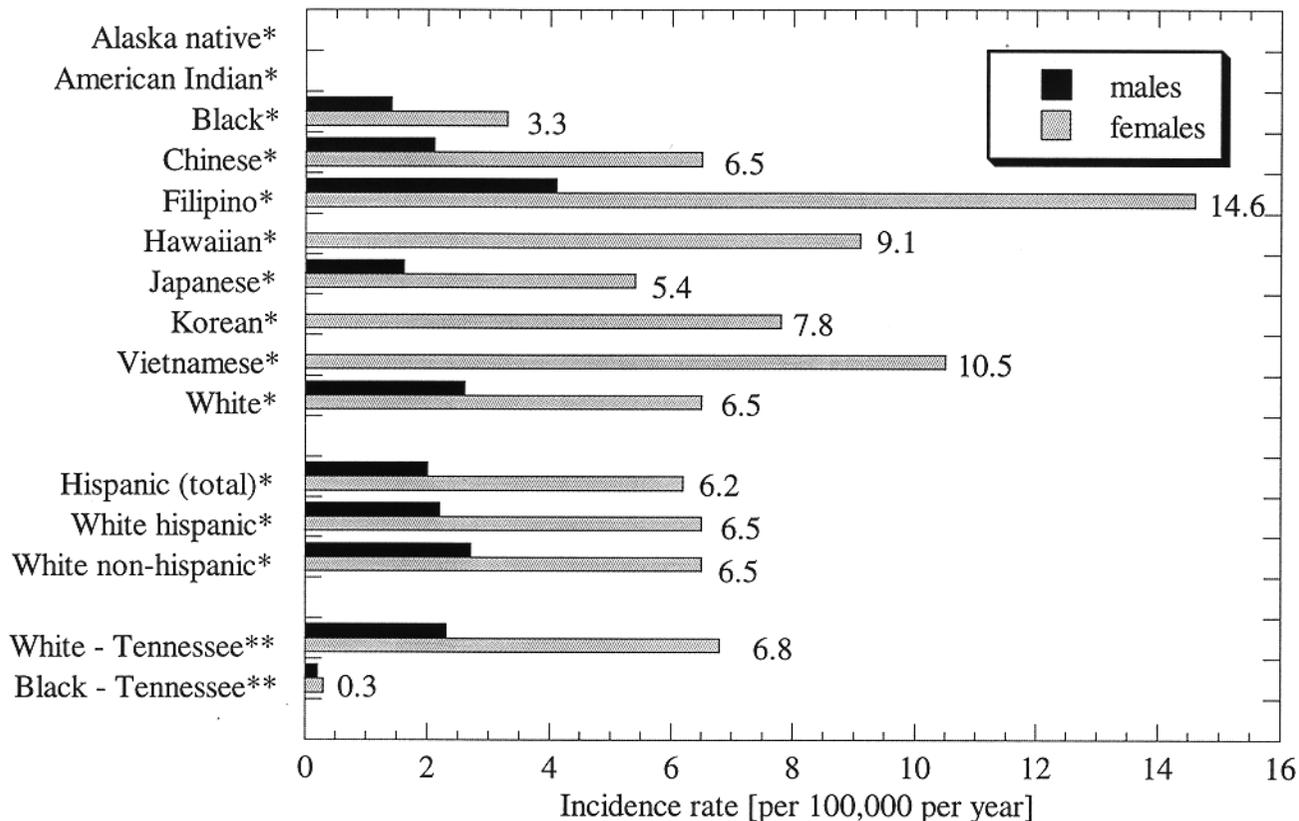


Figure 10-A.1 Influence of ethnic background on the incidence of thyroid cancer in the United States. Sources: (\*) SEER program of the National Cancer Institute; Reporting period 1988 - 1992 (Miller et al., 1996); and (\*\*) Tennessee Dept. of Health; Reporting period 1988-1995 (Turri, 1998).

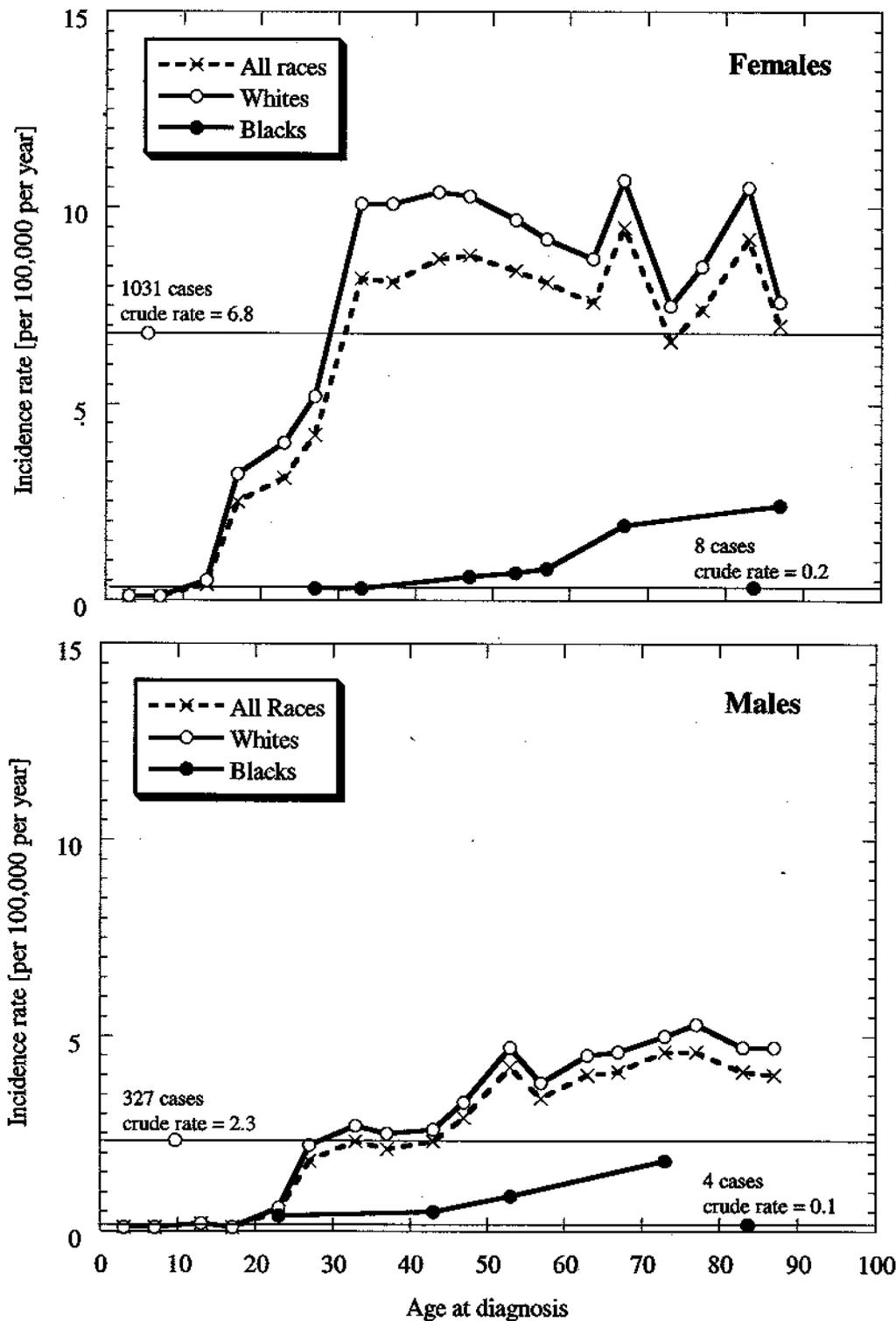


Figure 10-A.2 Thyroid cancer incidence rates for all Tennessee counties other than Anderson, Roane, Loudon and Knox counties. The reporting period is 1988 - 1995. Source: Tennessee Dept. of Health (Turri, 1998).

Similarly, in the region of interest, there are (a) 14,343,848 white males, (b) 3,007,888 black males, and (c) 17,351,736 males of all races (population numbers are summed from 1988 to 1995). Given that the background for white males is larger by only 14% than the background for males of all races combined ( $1.6 \times 10^{-3}$  versus  $1.4 \times 10^{-3}$ ), the background for black males must be about 28 times lower than the background for males of all races. That is, the risk estimates for black males should be a factor of 28 lower than the risk estimates for males of all races reported in this study.

#### **10A.4 Effect on the risk estimates of the changes in background incidence of thyroid cancer over the last few decades**

In the state of Tennessee, a systematic collection of data on thyroid cancer incidence has been performed only since the late 1980s. However, the incidence of thyroid cancer has been followed up for many years in selected regions of the United States under the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute. Data have been collected on a routine basis from 9 designated population-based cancer registries since 1973. The nine "standard" registries are the states of Connecticut, Iowa, New Mexico, Utah, and Hawaii and the metropolitan areas of Detroit, San Francisco, Seattle-Puget Sound, and Atlanta.

These data show that the thyroid cancer incidence rates increase with time (Figure 10-A.3). During 1973-1995, the rate of increase is about 10.7% per year for white females, but only 0.3% for black women. For males the rate of increase is about 3.4% per year for whites and 1.5% per year for blacks. This finding is very important for the understanding of the differences between individuals of different ethnic backgrounds. If the increasing trend were due only to the improvement of health care and cancer reporting systems, then the trend should be about the same for both blacks and whites. The large difference between the increasing background rates is an indication that there may be true ethnic differences in cancer risk induction.

If the thyroid cancer incidence varies with time, the risk estimates produced in this study (which are based on 1988-1995 data) might be biased. Therefore, the effect of the variation in incidence rates must be analyzed. For simplicity, let us make the following assumptions:

- a) the incidence rates change by a constant amount every year; that is, the rate of change is constant over time.
- b) the same rate of change applies to all age groups. That is, if the incidence rate for age group  $k$  is larger in one year than in the previous year by a certain amount, then this amount is the same for all age groups.
- c) If, in a given year, the incidence rate for the age group  $k$  is  $R_{0, k}$ , then the incidence rate for the same age group  $n$  years later is  $R_{0, k} (1 + \mathbf{a} n)$ , where  $\mathbf{a}$  is the rate of change in the incidence rate [per year].

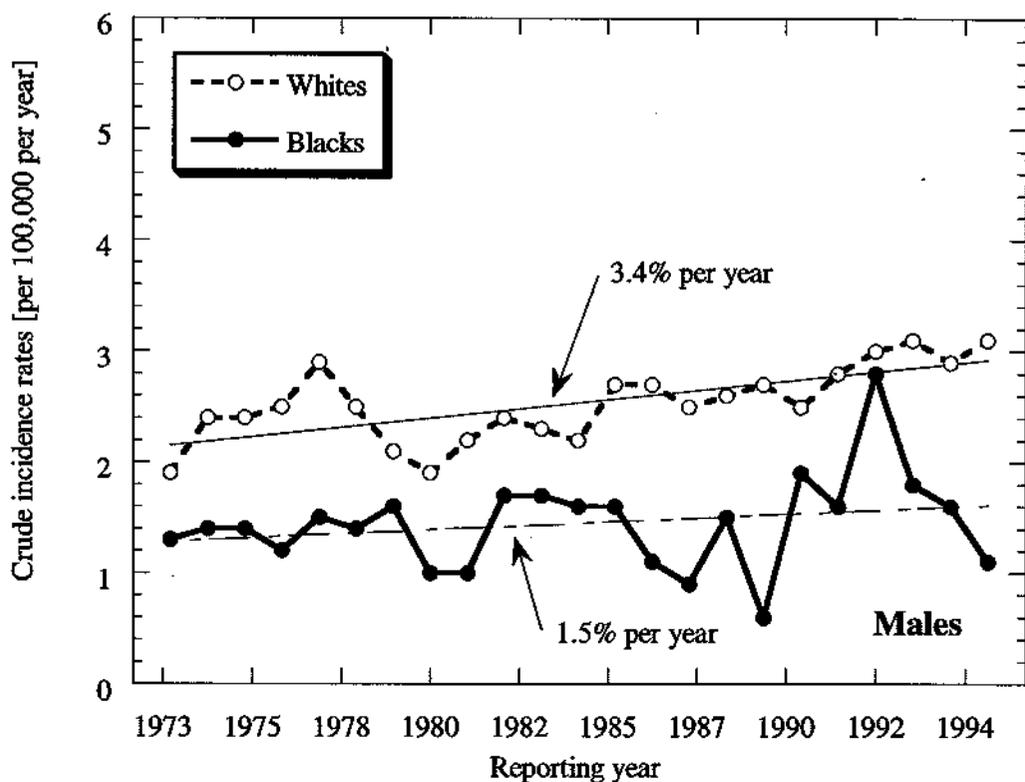
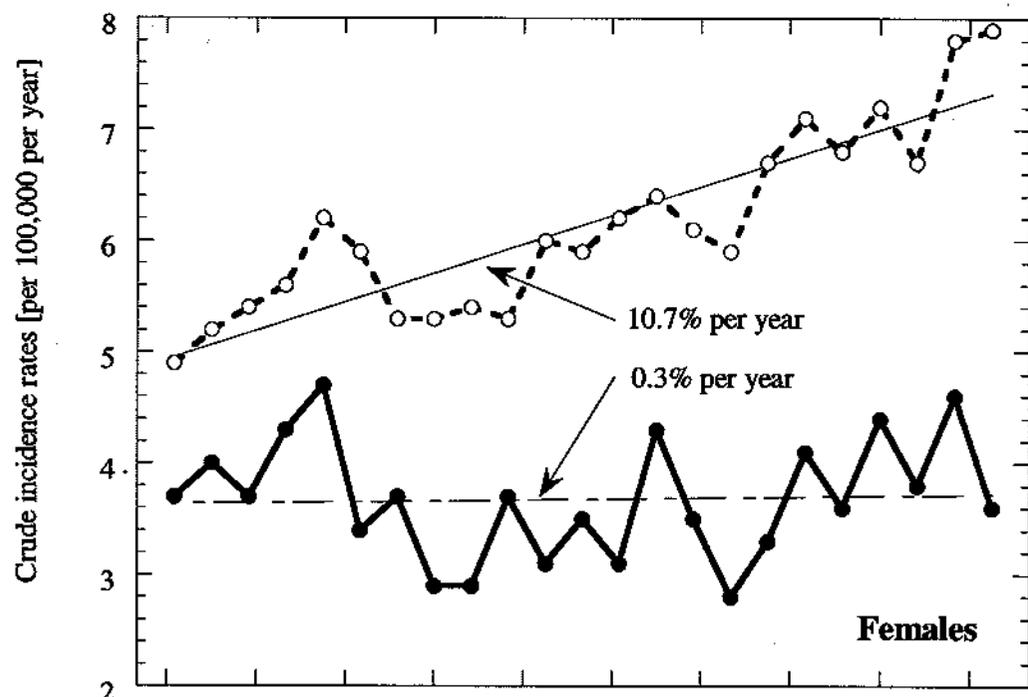


Figure 10-A.3 Increase in the thyroid cancer incidence rates in the United States as a function of time. Source: SEER program of the National Cancer Institute (Ries et al., 1998).

Taking the above assumptions into account, the excess lifetime risk of thyroid cancer in Equation 10-A.2 can be modified to

$$ELR(D_i) \cong \sum_{k=i}^{lifetime} (R_{1,k,i} \cdot \Delta t) = \mathbf{b}_i \cdot D_i \cdot \sum_{k=i+5}^{lifetime} (R_{0,k} \cdot (1 + \mathbf{a} \cdot n) \cdot \Delta t) = \mathbf{b}_i \cdot D_i \cdot B_i^*$$

and the new (adjusted) lifetime background risk of thyroid cancer ( $B_i^*$ ) will be given by:

$$B_i^* = \sum_{k=i+5}^{lifetime} (R_{0,k} \cdot (1 + \mathbf{a} \cdot n) \cdot \Delta t) = \sum_{k=i+5}^{lifetime} (R_{0,k} \cdot \Delta t) + \mathbf{a} \cdot \sum_{k=i+5}^{lifetime} (R_{0,k} \cdot n \cdot \Delta t)$$

If an individual is exposed at age  $i$ , and he or she is of age  $k$  at the moment of the data collection ( $k > i$ ), there are  $(k - i)$  years that have passed from the moment of exposure to the moment of the data collection. If the incidence rate data ( $R_{0,k}$ ) are available for the year of exposure (corresponding to age  $i$  of the individual), then the parameter  $n$  in the previous equation should be set to  $n = (k - i)$ .

If the incidence rate data ( $R_{0,k}$ ) are available for another year (e.g., when the individual is of age  $m$ ,  $m > k > i$ ), then parameter  $n$  in the previous equation must be set to  $n = ((m-i)-k) > 0$ ; that is,  $n^1$  must be set back to estimate the incidence rate in the year when the individual was of age  $i$ .

In this study, the incidence rates of thyroid cancer are available for the 1988-1995 reporting period (Turri, 1998). Exposures to <sup>131</sup>I released from X-10 took place from 1944 to 1956. Thus, there is a difference  $(m-i)$  of about 40 years from the exposure period to the period when the incidence rates are available.

The rate of change ( $\mathbf{a}$ ) in the incidence rates is unknown for the 1950 - 1990 period. Rates of change ( $\mathbf{a}$ ) are available for 1973 - 1995 period: 10.7%  $\bar{y}^1$  for white females, 0.3%  $\bar{y}^1$  for black females, 3.4% for white males, and 1.5% for black males (Figure 10-A.3).

The estimates of the excess lifetime risk in the case of a constant background ( $B_i$ ) were then compared to the estimates of the excess lifetime risk for the case when background is changing ( $B_i^*$ ). For the latter case, the rate of change in the background ( $\mathbf{a}$ ) was allowed to vary between 0.3%  $\bar{y}^1$  and 10.7%  $\bar{y}^1$ . In both cases, the background cancer incidence rates for females in all Tennessee counties other than Anderson, Roane, Loudon or Knox counties (Table 10-A.2) were used as a starting point. The comparison is performed in a relative manner:  $[(B_i^* - B_i)/(B_i)]$ , expressed in percent.

The results of this analysis are presented in Table 10-A.10. The table should be read in the following manner: If the rate of change in the background incidence of cancer was 0.3%  $\bar{y}^1$  for the entire period from 1950 to 1990, then the current excess lifetime risk estimates will decrease by 0.1% for an individual born in 1950, by 0.3% for an individual of age 10 in 1950, and so on.

<sup>1</sup> Note that, in the actual calculation, parameter  $n$  is taken to be negative, since the incidence rates are calculated at a past moment in time, when they should be lower.

Table 10-A.10 The effects of change with time of the background incidence of cancer on the current estimates of the excess lifetime risk of thyroid cancer.

year of birth	age at exposure (in 1950)	Relative change [%]			
		Variation rate in the background [% per year]			
		0.30%	1.5%	3.4%	10.7%
1950	0	-0.1%	-0.2%	0.3%	2.4%
1940	10	-0.3%	-1.7%	-3.9%	-10.8%
1930	20	-0.5%	-2.5%	-5.6%	-17.5%

By implementing the variation with time of the background cancer incidence, the changes in the risk estimates will be very small (<5%) in most cases. For the case when the rate of change in the incidence rate is 3.4% and is constant for 60 years, the estimated risks will decrease by 5.6%. When the rate of change in the incidence rate was set to 10.7%, the estimated bias in the risk estimate increased up to 18%. However, a rate of 10.7% per year was observed for white females only, and it does not apply for mixed races or for males. Also, it is unlikely that the rate of change is 10.7% for every year, because, starting with the incidence rates in the 1990s, the estimated incidence rates for the 1940s would approach zero.

Therefore, we conclude that although the incidence of thyroid cancer increases with time, this increasing trend has practically no effect on the risk estimates based on the data for 1988-1995. An explanation for this behavior is illustrated in Figure 10-A.4. Our lifetime risk estimates are produced assuming an average life expectancy of 70 years. A person born in 1950 will be 40 years of age in 1990, and thus will have, on average, 30 more years to live (until year 2020). Assuming that the incidence rate of thyroid cancer increased continuously for the entire period between 1950 and 2020, the value of the incidence rate measured in 1990 will overestimate the values for the 1950-1990 period, but will underestimate the values for 1990-2020 period. Thus, the overall bias in the estimates of total lifetime risk is negligible. If, for instance, the incidence rate were measured in year 2010, and if the same trend is maintained, then a significant overestimate of risk would be obtained by using those incidence rates.

In conclusion, in the risk estimates produced in this study, it is not necessary to account explicitly for the variation with time of the incidence of thyroid cancer.

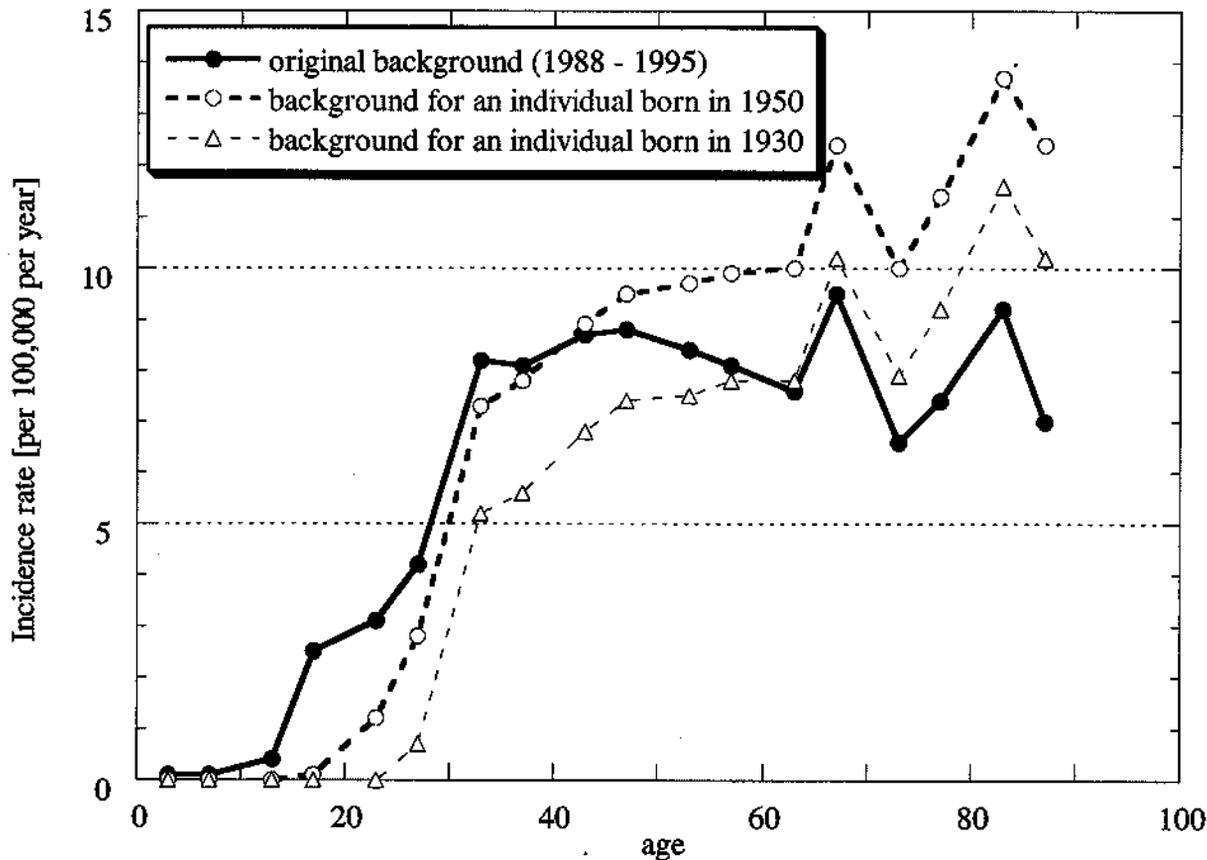


Figure 10-A.4 Adjustment of the background incidence rates for the effect of variation with time of the incidence rates of thyroid cancer. A variation in the incidence rates of 10.7% per year was assumed for all years.

**10A.5 Correction of the lifetime "background" risk of thyroid cancer incidence for the contribution from the Nevada Test Site Fallout**

The problem of correcting the cancer incidence rate observed in the 1990s for the contribution from cases induced by NTS fallout is conceptually simple. Assuming a linear relative model, the incidence rate measured in the 1990s is

$$R = R_0 \cdot h = R_0 \cdot (1 + \mathbf{b} \cdot D),$$

where

$R$  = the cancer incidence rate including the contribution from cases induced by the NTS fallout (i.e., the current observed values presented in Section 10-A.1);

$R_0$  = the cancer incidence rate in the absence of NTS fallout;

$h$  = the dose-response function;

$\mathbf{b}$  = the excess relative risk per unit dose for  $^{131}\text{I}$ ; and

$D$  = the radiation dose from NTS fallout.

To correct for the contribution of NTS fallout to the background incidence of cancer as observed in the 1990s, one must determine  $R_0$  from the previous equation. That is,

$$R_0 = \frac{R_1}{(1 + \mathbf{b} \cdot D)}$$

However, the problem becomes very complicated because NTS fallout occurred over 8 years (1951 to 1958), and the 1990s incidence rates were also collected over 8 years (1988 to 1995). Given this situation, one must take into account the age dependency of the excess relative risk per unit dose ( $\mathbf{b}$ ) and the year in which the exposed individual was born.

Individuals of certain ages diagnosed in any year between 1988-1995 have an increased risk of thyroid cancer from exposure to NTS fallout. This increased risk can be estimated in terms of an excess relative risk ( $ERR$ ) from the thyroid doses received in the 1950s due to NTS fallout.

$$ERR(\text{age}_1, \text{year}) = \sum_{\text{ibirth}=1935}^{1958} \sum_{\text{ifallout}=1951}^{1958} \left( \frac{ERR_{15y}(\text{age}_2)}{\mathbf{d}} \right) \cdot \mathbf{e}(\text{age}_2) \cdot D(\text{ib}, \text{ir})$$

where

$\text{year}$  = year when cancer incidence is detected (1988 through 1995);

$\text{age}_1$  = age in the year of incidence detection (it varies from 30 to 60 years);

$\text{ibirth}$  = year of birth for people exposed as children to NTS fallout (1935-1958);

- ifallout* = year of fallout from NTS (1951-1958);  
*ib* = *ibirth-1934* (counter for the year of birth);  
*ir* = *ifallout-1950* (counter for the year of fallout);  
*D(ib,ir)* = thyroid dose for an individual born in year "*ibirth*" from exposure to NTS fallout in year "*ifallout*";  
*age<sub>2</sub>* = *ifallout-ibirth+1* (counter for the age during a given year of fallout; it must be larger than zero);  
*ERR(age<sub>2</sub>)* = excess relative risk per unit dose for an individual of age "*age<sub>2</sub>*", from epidemiological studies of children exposed to X- and gamma rays;  
*e(age<sub>2</sub>)* = modifier for the *ERR(age<sub>2</sub>)* for an individual of age "*age<sub>2</sub>*"; and  
**d** = <sup>131</sup>I effectiveness factor (Section 10).

Averaging over all years of detection (8 years) and over all ages in an age group of the epidemiological data (5 years), one obtains

$$ERR(age_1) = \frac{1}{8} \sum_{year=1988}^{1995} ERR(age_1, year)$$

and

$$RR(age\ group) = 1 + \frac{1}{5} \sum_{age_1}^{age_1+5} ERR(age_1)$$

The corrected incidence rate (*CIR*) for a given age group is determined as a function of the observed incidence rate (*IR*):

$$CIR(age\ group) = IR(age\ group) / RR(age\ group)$$

This approach was applied for the females exposed during 1951-1958. The estimated thyroid doses received by females living in Anderson County, Tennessee, who were on an average diet of milk are presented in Table 10-A.11. The measured (Table 10-A.3) and the corrected thyroid cancer incidence rates are presented in Table 10-A.12 and in Figure 10-A.5.

The corrected incidence rates must then be integrated by using Equation 10-A.3 to obtain a corrected "lifetime" background incidence of thyroid cancer. The overall impact in the risk estimates is obtained by comparing the original and the corrected lifetime background of thyroid cancer incidence (Figures 10-A.5 and 10-A.6).

The difference between the two lifetime backgrounds is less than 6% (Figures 10-A.5 and 10-A.6; Table 10-A.12). That is, the contribution of NTS fallout in changing the background incidence of cancer produces a negligible impact on the lifetime risk estimates produced in this study.





Table 10-A.12 Comparison between the thyroid cancer incidence rates observed during 1988-1995 in Tennessee and the thyroid cancer incidence rates corrected for the contribution of NTS fallout.<sup>a</sup>

age-group	Observed incidence rates	Corrected incidence rates	
0-4	0.1	0.1	
5-9	0.1	0.1	
10-14	0.4	0.4	
15-19	2.5	2.5	
20-24	3.1	3.1	
25-29	4.2	4.2	
30-34	8.2	<b>8.1</b>	Age groups affected by correction for NTS fallout
35-39	8.1	<b>7.9</b>	
40-44	8.7	<b>8.0</b>	
45-49	8.8	<b>7.3</b>	
50-54	8.4	<b>7.0</b>	
55-59	8.1	<b>7.4</b>	
60-64	7.6	7.6	
65-69	9.5	9.5	
70-74	6.6	6.6	
75-79	7.4	7.4	
80-84	9.2	9.2	
85+	7.0	7.0	

<sup>a</sup>Age groups affected by correction for NTS fallout include 30-34, 35-39, 40-44, 45-49, 50-54, and 55-59.

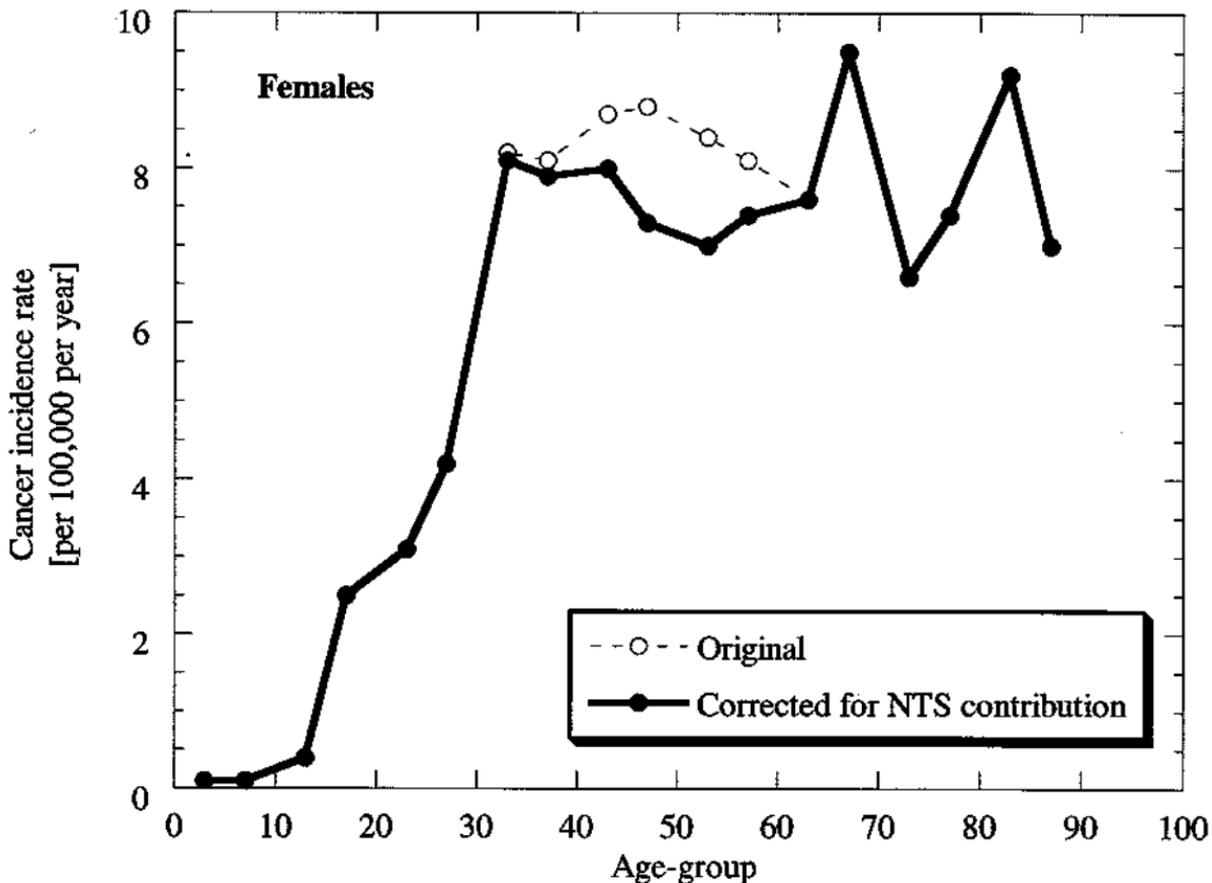


Figure 10-A.5 Comparison between the observed thyroid cancer incidence rates and the rates corrected for the contribution of NTS fallout. The reporting period for the data is 1988-1995 (Turri, 1998).

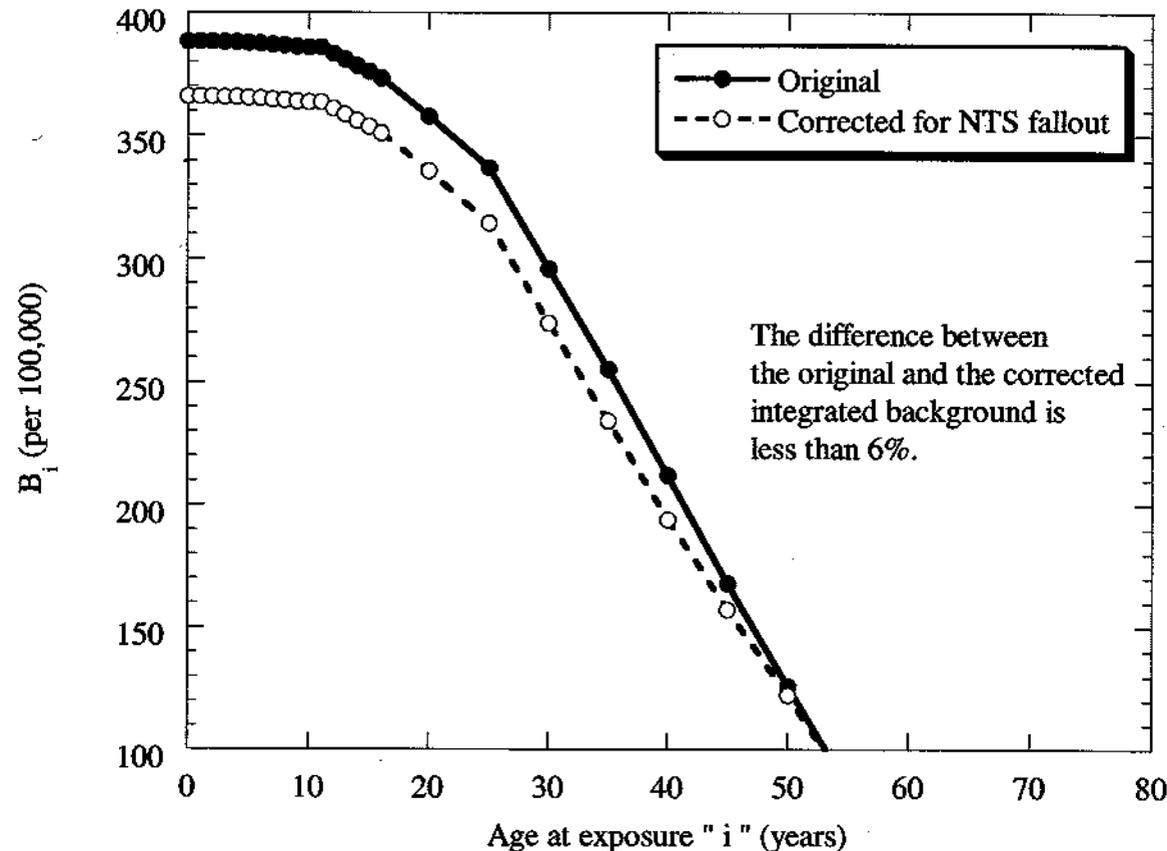


Figure 10-A.6 Comparison between the original background lifetime risk of thyroid cancer and the same background corrected for the contribution of NTS fallout. The data represent females in all counties in Tennessee other than Anderson, Roane, Loudon and Knox counties, as reported between 1988 and 1995 (Turri, 1998).

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**APPENDIX 11A**

**RATIONALE FOR LOCATIONS**

**AND EXPOSURE PATHWAYS**

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## APPENDIX 11A: RATIONALE FOR LOCATIONS AND EXPOSURE PATHWAYS

The location of individuals exposed to <sup>131</sup>I releases from X-10 due to RaLa operations is an important element of the dose reconstruction for Task 1. Each exposure pathway must be evaluated with respect to specific population clusters that might have been affected. For <sup>131</sup>I, the primary human exposure pathways considered in this analysis are direct inhalation; ingestion of milk (backyard cow's, commercial, and goat's), cottage cheese, and meat from cattle grazing on contaminated pasture grass; ingestion of eggs; ingestion of leafy vegetables; and ingestion of breast milk. The period of interest for the analysis of the local population described here spans from 1944 to 1956. Figure 11.1 presents the locations within a 38-km circle around the RaLa processing facility at which doses and risks were evaluated. The rationales for the choice of these locations are provided below.

The milk and meat exposure pathways generally affected the same populations because most rural farms in Anderson, Blount, Knox, Loudon, Morgan, and Roane counties raised both beef and dairy cattle (Waller, 1996; Stokes, 1996; Prichard, 1997; Clark, 1997; Harkins, 1998; Lowe, 1997; Hackett, 1998; Hudson, 1998; Zirkle, 1996; Wade, 1996; Idom, 1997; Jenkins, 1997; Mickey, 1996). If backyard cows were present, cottage cheese could have been produced and consumed; therefore the cottage cheese pathway is considered for the same locations as the backyard cow. The egg consumption and vegetable consumption pathways were also considered for these same locations due to the high probability that each farm raised a few chickens and a vegetable garden. All locations were considered for the inhalation, commercial milk, and breast milk pathways. Goat's milk was considered for those areas where confirmed usage existed as well as for those areas that were predominantly rural and agricultural. This study included various locations in Oak Ridge (Woodland, Scarboro, Oak Ridge High School, and East Fork Poplar Creek), Norwood, Oliver Springs, Jonesville, Dyllis, Wartburg, Oakdale, Harriman, Rockwood, Sugar Grove, Lawnville, Kingston, Barnardsville, Bradbury, Hines Valley Community, Lenoir City, Loudon, Sweetwater, Hope Creek Community, Greenback, Friendsville, Louisville, Maryville, Rockford, Farragut, Cedar Bluff, Buttermilk Road Community, Gallaher Bend Community, Hardin Valley, Solway, Karns, Knoxville, Claxton, Clinton, Dutch Valley, Cedar Grove, and Lake City.

The City of Oak Ridge is a population cluster of interest in which five local points were monitored for <sup>131</sup>I and other radionuclides in air (see Section 4). Within the City of Oak Ridge, several locations were considered representative population clusters: the Oak Ridge High School area, the Scarboro Community, the Woodland Community, and the Oak Ridge Town Site area (see Figure 11.1). Although the residents in these areas may not have grown produce or raised animals, their potential for obtaining locally grown food was high due to the practices of "truck farming" and "rolling stores." "Truck farming" and "rolling stores" involved individuals who grew their own produce and sold it out of their trucks (Wade, 1998; Harkins, 1998). These practices were common in the Oak Ridge and Knoxville areas.

Within Oak Ridge, potential exposure pathways include inhalation, ingestion of milk and meat from animals grazing on contaminated pasture grass, and ingestion of leafy vegetables from gardens. The consumption of human breast milk also occurred. Personal communications with several former

residents (e.g., Hileman, Clark, Vowell, Brooks) contributed to the following overview of possible exposures.

Interviews indicated that beef and dairy cattle were kept in small numbers along East Fork Poplar Creek (EFPC). At least two of the 3 or 4 families living along EFPC had dairy cattle for their own family use over a period of several years in the 1950s. However, no evidence of commercial dairies or the sale of local milk to commercial dairies was found. There was also no indication of any dairy goats in the Oak Ridge area.

Approximately half the land along EFPC on the south side of the Oak Ridge Turnpike was used for grazing beef cattle, starting in the 1950s. Four or five families slaughtered at least one beef cow a year for personal use; the rest were raised for resale. No grain was raised except for livestock feed. One family had chickens and sold them locally for about 5 years, and other interviewees mentioned hearing or seeing chickens. It is possible, though not confirmed through interviews, that eggs from local chickens were available.

At least one, perhaps more, vegetable gardens were grown near EFPC, and occasional vegetable gardens were mentioned in connection with other sections of Oak Ridge (Jenkins, 1997). Tomatoes and corn from local land may have been sold at a grocery store near the Oak Ridge Turnpike. Other occasional wild food gathering activities (blackberries, walnuts, mushrooms and grapes, as well as honey collection) could have been minor contributors to exposure.

Oliver Springs and Norwood are also communities potentially affected by the <sup>131</sup>I releases from X-10. Oliver Springs was once a coal mining town, while Norwood is a small agricultural community located to the southeast of Oliver Springs. Beef and dairy cattle were raised in these areas for personal consumption (Lowe, 1997).

Clinton and Claxton are population clusters located northeast of X-10. These areas were of concern due to the presence of dairy and beef cattle, in addition to chickens, pigs, and goats (Clark, 1997). In the Claxton area, one family was known to consume goat's milk as well as cow's milk (Clark, 1997). The goat's milk was not sold commercially in this area. Backyard cow's milk, however, was sold to neighbors, along with cream, butter, and eggs (Clark, 1997). Vegetable gardens were also grown in these two areas.

Lake City is the farthest northerly location selected. Despite its being a rural mountainous area, beef cattle, pigs, and chickens were raised in Lake City, along with vegetable gardens. Produce frequently grown in this area included beans, onions, tomatoes, and potatoes. These items were generally consumed by extended families and neighbors.

Cedar Grove and Dutch Valley are located to the northeast of the X-10 facility. These rural communities are predominantly agricultural. Corn and hay are a few of the crops grown in these areas (Courier-News, 1998). Presently, dairy cattle are limited to a few farms, but beef cattle dot the landscape on most larger farms. Although not confirmed through interviews, vegetable gardens were considered to have been grown by most individuals in the Cedar Grove and Dutch Valley areas.

Wartburg and Oakdale are rural communities located in Morgan County in the Cumberland Mountains. These areas have regions in which farming is practiced, but most of the land is too rugged to have large farming tracts. Vegetable gardens are grown by most individuals in this area, with the most popular crops being tomatoes and beans. Beef cattle grazed the mountainsides, while dairy cattle were kept close to the house. Most individuals were assumed to have backyard cows. No large commercial dairies were located in these areas, but local sale of milk cannot be excluded. Oak Ridge and Harriman are the closest urban areas.

Agriculture has been and is still practiced in small communities in Roane County, such as Dyllis and Jonesville. The communities in these locations continue to raise beef cattle and to plant crops for production (grain and hay) and for family consumption. The number of grocery stores in Dyllis and Jonesville was limited; therefore, residents often produced their own food or traveled to nearby cities (e.g., Harriman, Oliver Springs, or Oak Ridge) to purchase groceries.

Harriman was another population cluster where urban and rural individuals raised livestock and grew crops (Lowe, 1997). The crops and livestock were used primarily for family consumption, but were also shared with friends and neighbors. Harriman was also serviced by local milk deliveries from the Bradbury community (Prichard, 1997) and by local dairies (Lowe, 1997).

Sugar Grove lies in the Sugar Grove Valley, which is approximately due west of the X-10 facility. This small rural community was an area in which beef cattle grazed the hillsides and vegetable gardens were planted. Hay, tobacco, onions, potatoes, beans, tomatoes, berries, corn, and other grains were grown as well (Adkins, 1997; Lowe, 1997).

Rockwood is located to the southwest of X-10 and is predominantly rural, with several farms. Hay, tobacco, and other grains are produced in this location. If acreage was owned, vegetable gardens were planted. Tomatoes, beans, potatoes, and other root crops were grown in this area, and beef cattle were also raised for family consumption.

For the Kingston area, parcels of farm land were located both within and outside the city limits. Raising livestock and planting gardens were an integral part of life in this area. Beef and dairy cattle were raised, in addition to chickens, pigs, sheep, and goats (Prichard, 1997). Several residents in the rural Kingston area consumed goat's milk (Prichard, 1997). During interviews that were conducted with local residents, one farm was identified as raising goats. The farm raised approximately 60-70 goats for milk production and for land clearing purposes (Prichard, 1997). Goat's milk was not sold commercially in Kingston; however, family members and neighbors who preferred goat's milk to cow's milk utilized the milk (Prichard, 1997).

Individuals living within the city limits of Kingston could have had access to farm-raised milk (through creameries and local deliveries) and meat (through local grocers and meat companies). For example, residents of the Bradbury community often delivered milk to the homes of residents in Kingston, Harriman, Oakdale, and Oak Ridge until the 1950s (Prichard, 1997). Local grocery stores in Kingston carried farm-raised beef, and slaughterhouses were also present in this area (Stokes, 1997). In addition, excess local milk was often sold to local grocery stores after refrigeration became available (Adkins, 1997).

The communities living along Gallaher Road in Roane County (Gallaher/Lawnville communities) were also considered in this analysis. Gallaher Road is located between Pine and Black Oak Ridges and is predominantly agricultural. Beef and dairy cattle were raised in this area, along with vegetable gardens. Hay and grain crops were also produced in this area.

Barnardsville is located in the southwestern section of Roane County and is predominantly rural. Beef cattle can still be seen in this area today. Hay and tobacco were also grown in this area. Vegetable gardens and dairy cattle were assumed to have been raised here as well.

For the Bradbury community (located near Jones Island in Loudon and Roane counties), beef cattle were the primary livestock; however, each farm had its own dairy cattle to produce milk for the family (Waller, 1996). Local meat (beef) and milk were not sold commercially in the Bradbury area due to the lack of refrigeration (Waller, 1996).

The closest urban area to the Bradbury community was Lenoir City. Even though this area was considered urban, farms were located within the city limits. These farms raised livestock (beef and dairy cattle, chickens, and pigs) and continue to raise a limited amount of livestock today. Small gardens were planted, since the land was predominantly used for grazing and the production of grain and hay.

Hines Valley is also an agricultural community. Pigs, beef, and dairy cattle were raised in this area for local consumption (Idom, 1997). Hay and other grains were grown in this area, in addition to vegetable gardens.

Loudon and Sweetwater are also considered urban areas, but farms and agricultural land are predominant in these areas. Beef and dairy cattle, along with pigs were prominently raised in this area. The Sweetwater area was supplied with feeder pigs from the Hines Valley area (Idom, 1997). Large gardens (corn and soybeans) can still be viewed in these areas today, especially along the Tennessee River.

Greenback, Friendsville, and Louisville are located southeast of the X-10 facility and were affected by the releases of <sup>131</sup>I. These areas are primarily agricultural, with the closest urban areas being Lenoir City and Maryville. Tobacco, corn, hay, and soybeans were the primary crops. Beef and dairy cattle were also raised in these areas. Maryville is considered an urban area, but large farming tracts of land are located on the outskirts of the city. Beef cattle were the predominant animals raised; some vegetable gardens were grown as well.

Rockford is another small community that lies south of Knoxville. This was a predominantly agricultural area and continues to be the home of a large portion of the University of Tennessee's Agricultural Experiment Station. Holstein cattle can still be seen grazing this land. Vegetable gardens and hay crops are also grown in this community.

The Buttermilk, Hardin Valley, Gallaher Bend, and Hope Creek communities are predominantly agricultural areas. Beef and dairy cattle were raised here along with chickens and pigs, as early as the Civil War (Ward, 1998; Hackett, 1998; Hudson, 1998). One family in the Gallaher Bend area raised goats and consumed the milk (Hackett, 1998; Hudson, 1998). Grain, hay, and tobacco were the

largest crops grown in these four areas; however, vegetables gardens were also grown. These four communities are still predominantly agricultural areas.

Solway was an area in which beef and dairy cattle were present in the 1940s and 1950s (Wade, 1996). Goats, pigs, and chickens were also raised in this area. Vegetable gardens were grown for family consumption as well as for resale. Individuals known as “truck farmers” took excess vegetables to the Knoxville Farmer’s Market on Market Street in downtown Knoxville and to Oak Ridge markets for resale (Wade, 1996). Excess milk was sold to other local farmers for use as food for pigs (Wade, 1996).

Knoxville was considered important for this study due to the presence of cattle in areas surrounding downtown Knoxville, such as north and west Knoxville. Large farms existed in the Farragut, Karns, and Cedar Bluff areas (Harkins, 1998). These farms raised beef and dairy cattle, in addition to vegetable gardens, from which excess produce was taken to Market Square and the Forrest Avenue Farmer’s Market in Knoxville. Milk from the Cedar Bluff area was sold commercially to larger dairies in the area (Harkins, 1998). Beef cattle are still raised on the outskirts of Knoxville today. The Knoxville area also received vegetables grown in the Oak Ridge area and outlying regions via the Farmer’s Market, which was originally located on Market Street (Wade, 1997), and the Forrest Avenue Farmer’s Market.

Table 11-A.1 provides a summary of the locations of interest and the exposure pathways of concern. The table locations are arranged in order of increasing distance from the X-10 facility. The pathways that were considered relevant for a specific location are identified by a number “1.” Those pathways not considered applicable to residents at a given location are described with a “0.” Inhalation of <sup>131</sup>I was considered at all sites. The consumption patterns of the individuals considered to be reference individuals consisted of three diets. Diet 1 consisted of the backyard milk pathway in addition to consumption of vegetables, meat, cheese, and eggs. Ingestion of local commercial milk, and ingestion of meat, eggs, vegetables, and cheese make up Diet 2. Diet 3 describes an individual who consumed regional commercial milk.



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**APPENDIX 11B**  
**ESTIMATED <sup>131</sup>I CONCENTRATIONS**  
**IN ENVIRONMENTAL MEDIA**

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## APPENDIX 11B

### ESTIMATED <sup>131</sup>I CONCENTRATIONS IN ENVIRONMENTAL MEDIA

This Appendix presents the estimated concentrations of <sup>131</sup>I in various environmental media and food products as a result of the 1944-1956 releases from the X-10 radioactive lanthanum processing facility located in Oak Ridge, Tennessee. These concentrations represent time-averages over the entire 13 years of releases and include the effects of both routine releases and the accidental release of April 29, 1954.

The results are presented separately for each of the 41 locations of interest (Appendix 11A) within a 38-km radius around the RaLa facility. For each location, the following concentrations are given:

- Ground-level concentrations of <sup>131</sup>I in air (the concentrations represent total iodine, or all three physico-chemical forms combined)
- Concentrations of <sup>131</sup>I in leafy vegetables
- Concentrations of <sup>131</sup>I in pasture grass
- Concentrations of <sup>131</sup>I in milk of “backyard” cows
- Concentrations of <sup>131</sup>I in milk of “commercial” cows (concentrations are given separately for local and regional distribution of commercially produced milk)
- Concentrations of <sup>131</sup>I in milk of goats
- Concentrations of <sup>131</sup>I in locally produced meat
- Concentrations of <sup>131</sup>I in cheese produced from contaminated milk
- Concentrations of <sup>131</sup>I in eggs from chickens fed contaminated feed
- Concentrations of <sup>131</sup>I in human breast milk

The results are presented as 95% subjective confidence intervals (2.5th and 97.5th percentiles) and a central estimate (50th percentile). A 95% subjective confidence interval is expected, at the 95th percent level of confidence, to encompass the true but unknown concentration of <sup>131</sup>I. The confidence intervals are called “subjective” because they are based in part on assumptions made using expert judgment and on professional analysis of the exposure situation. Other investigators may come to slightly different results, but the final conclusions are not expected to change significantly.

At some locations, the concentration for an endpoint may be zero (e.g., no cows were present in downtown Oak Ridge during the 1940s or 1950s). For these locations, a dash “-” is shown in the tables.

**Location: Barnardville**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.013	0.021	0.035
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	51	150	440
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	2.6	8.6	32
Commercial milk (locally produced)	Bq L <sup>-1</sup>	1.7	5.2	15
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	9	41	160
Beef	Bq kg <sup>-1</sup>	0.42	2.5	16
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	3.4	10.0	33
Cottage Cheese	Bq kg <sup>-1</sup>	0.8	4.8	31
Eggs	Bq kg <sup>-1</sup>	1.4	5.8	25
Mother's milk*	Bq L <sup>-1</sup>	0.18	1.4	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Bradbury**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.074	0.110	0.160
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	470	1300	3300
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	24.0	74.0	250
Commercial milk (locally produced)	Bq L <sup>-1</sup>	15.0	43.0	120
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	79	340	1300
Beef	Bq kg <sup>-1</sup>	3.80	22.0	140
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	30.0	88.0	250
Cottage Cheese	Bq kg <sup>-1</sup>	6.9	39.0	240
Eggs	Bq kg <sup>-1</sup>	12.0	49.0	200
Mother's milk*	Bq L <sup>-1</sup>	0.38	2.6	15.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Buttermilk Rd.**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.057	0.082	0.120
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	320	870	2300
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	17.0	51.0	190
Commercial milk (locally produced)	Bq L <sup>-1</sup>	10.0	30.0	85
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	53	240	900
Beef	Bq kg <sup>-1</sup>	2.50	16.0	92
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	20.0	59.0	170
Cottage Cheese	Bq kg <sup>-1</sup>	5.1	28.0	180
Eggs	Bq kg <sup>-1</sup>	8.6	34.0	140
Mother's milk*	Bq L <sup>-1</sup>	0.33	2.2	13.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Cedar Bluff**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.028	0.041	0.060
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	130	340	910
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	6.4	20.0	68
Commercial milk (locally produced)	Bq L <sup>-1</sup>	4.0	12.0	33
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	21	93	340
Beef	Bq kg <sup>-1</sup>	1.00	6.0	37
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	8.1	23.0	69
Cottage Cheese	Bq kg <sup>-1</sup>	1.9	11.0	64
Eggs	Bq kg <sup>-1</sup>	3.2	13.0	56
Mother's milk*	Bq L <sup>-1</sup>	0.23	1.7	11.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Cedar Grove**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.013	0.020	0.031
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	54	150	390
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	2.9	8.8	31
Commercial milk (locally produced)	Bq L <sup>-1</sup>	1.8	5.1	15
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	9	41	160
Beef	Bq kg <sup>-1</sup>	0.46	2.6	16
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	3.6	10.0	31
Cottage Cheese	Bq kg <sup>-1</sup>	0.9	4.8	31
Eggs	Bq kg <sup>-1</sup>	1.5	5.8	24
Mother's milk*	Bq L <sup>-1</sup>	0.18	1.4	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Claxton**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.023	0.034	0.049
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	110	280	740
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	5.5	17.0	57
Commercial milk (locally produced)	Bq L <sup>-1</sup>	3.4	9.7	28
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	17	78	290
Beef	Bq kg <sup>-1</sup>	0.85	5.1	31
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	6.7	19.0	56
Cottage Cheese	Bq kg <sup>-1</sup>	1.6	9.1	55
Eggs	Bq kg <sup>-1</sup>	2.8	11.0	46
Mother's milk*	Bq L <sup>-1</sup>	0.21	1.6	11.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Clinton**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.018	0.026	0.039
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	82	220	580
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	4.3	13.0	45
Commercial milk (locally produced)	Bq L <sup>-1</sup>	2.6	7.4	22
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	13	60	210
Beef	Bq kg <sup>-1</sup>	0.64	3.9	23
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	5.4	15.0	45
Cottage Cheese	Bq kg <sup>-1</sup>	1.3	7.1	44
Eggs	Bq kg <sup>-1</sup>	2.1	8.5	36
Mother's milk*	Bq L <sup>-1</sup>	0.19	1.5	11.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Dutch Valley**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.010	0.016	0.025
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	51	140	360
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	2.7	8.1	29
Commercial milk (locally produced)	Bq L <sup>-1</sup>	1.6	4.8	13
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	8	36	150
Beef	Bq kg <sup>-1</sup>	0.38	2.4	15
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	3.3	9.4	27
Cottage Cheese	Bq kg <sup>-1</sup>	0.8	4.3	29
Eggs	Bq kg <sup>-1</sup>	1.3	5.3	23
Mother's milk*	Bq L <sup>-1</sup>	0.17	1.4	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Dyllis**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.010	0.017	0.030
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	56	170	470
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	3.0	9.8	39
Commercial milk (locally produced)	Bq L <sup>-1</sup>	2.0	5.7	18
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	9	47	190
Beef	Bq kg <sup>-1</sup>	0.47	3.0	18
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	3.6	12.0	36
Cottage Cheese	Bq kg <sup>-1</sup>	0.9	5.4	39
Eggs	Bq kg <sup>-1</sup>	1.6	6.6	30
Mother's milk*	Bq L <sup>-1</sup>	0.17	1.4	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: EFPC**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.018	0.030	0.047
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	120	330	910
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	5.9	19.0	66
Commercial milk (locally produced)	Bq L <sup>-1</sup>	3.7	11.0	33
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	--	--	--
Beef	Bq kg <sup>-1</sup>	0.91	5.6	39
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	7.4	22.0	65
Cottage Cheese	Bq kg <sup>-1</sup>	1.8	10.0	65
Eggs	Bq kg <sup>-1</sup>	3.1	13.0	51
Mother's milk*	Bq L <sup>-1</sup>	0.21	1.6	11.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Farragut**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.029	0.045	0.067
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	150	410	1200
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	7.9	24.0	84
Commercial milk (locally produced)	Bq L <sup>-1</sup>	4.7	14.0	44
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	25	110	440
Beef	Bq kg <sup>-1</sup>	1.20	7.2	46
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	9.5	28.0	87
Cottage Cheese	Bq kg <sup>-1</sup>	2.2	13.0	80
Eggs	Bq kg <sup>-1</sup>	3.8	16.0	69
Mother's milk*	Bq L <sup>-1</sup>	0.24	1.8	12.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Friendsville**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.011	0.018	0.030
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	40	120	400
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	2.2	7.2	28
Commercial milk (locally produced)	Bq L <sup>-1</sup>	1.2	4.3	15
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	7	34	150
Beef	Bq kg <sup>-1</sup>	0.36	2.1	14
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	2.6	8.8	30
Cottage Cheese	Bq kg <sup>-1</sup>	0.6	4.2	27
Eggs	Bq kg <sup>-1</sup>	1.1	4.8	23
Mother's milk*	Bq L <sup>-1</sup>	0.18	1.4	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Gallaher Bend**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.096	0.140	0.200
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	580	1600	3900
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	31.0	92.0	290
Commercial milk (locally produced)	Bq L <sup>-1</sup>	19.0	54.0	140
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	94	420	1700
Beef	Bq kg <sup>-1</sup>	4.50	26.0	160
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	35.0	110.0	290
Cottage Cheese	Bq kg <sup>-1</sup>	8.3	48.0	300
Eggs	Bq kg <sup>-1</sup>	15.0	59.0	240
Mother's milk*	Bq L <sup>-1</sup>	0.42	2.9	16.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Greenback**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.008	0.013	0.022
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	26	80	270
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	1.4	5.0	20
Commercial milk (locally produced)	Bq L <sup>-1</sup>	0.9	2.8	10
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	4	22	95
Beef	Bq kg <sup>-1</sup>	0.23	1.4	10
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	1.7	5.7	20
Cottage Cheese	Bq kg <sup>-1</sup>	0.4	2.7	20
Eggs	Bq kg <sup>-1</sup>	0.8	3.2	15
Mother's milk*	Bq L <sup>-1</sup>	0.16	1.3	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Hardin Valley**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.054	0.080	0.110
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	300	780	2000
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	15.0	47.0	160
Commercial milk (locally produced)	Bq L <sup>-1</sup>	9.3	27.0	77
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	49	220	800
Beef	Bq kg <sup>-1</sup>	2.40	14.0	79
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	19.0	54.0	150
Cottage Cheese	Bq kg <sup>-1</sup>	4.6	25.0	160
Eggs	Bq kg <sup>-1</sup>	7.6	31.0	130
Mother's milk*	Bq L <sup>-1</sup>	0.32	2.2	13.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Harriman**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.010	0.016	0.025
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	55	140	370
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	2.9	8.5	30
Commercial milk (locally produced)	Bq L <sup>-1</sup>	1.8	4.9	14
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	8	38	160
Beef	Bq kg <sup>-1</sup>	0.40	2.6	15
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	3.6	9.6	28
Cottage Cheese	Bq kg <sup>-1</sup>	0.8	4.5	31
Eggs	Bq kg <sup>-1</sup>	1.4	5.5	26
Mother's milk*	Bq L <sup>-1</sup>	0.16	1.4	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Hines Valley**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.027	0.041	0.060
Pasture grass	Bq kg <sup>-1</sup> dry mass	130	370	980
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	6.6	21.0	76
Commercial milk (locally produced)	Bq L <sup>-1</sup>	4.1	12.0	37
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	22	97	390
Beef	Bq kg <sup>-1</sup>	1.00	6.4	39
Leafy vegetables	Bq kg <sup>-1</sup> fresh mass	8.0	25.0	76
Cottage Cheese	Bq kg <sup>-1</sup>	2.1	12.0	70
Eggs	Bq kg <sup>-1</sup>	3.3	14.0	58
Mother's milk*	Bq L <sup>-1</sup>	0.23	1.7	11.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Hope Creek**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.056	0.082	0.120
Pasture grass	Bq kg <sup>-1</sup> dry mass	320	900	2300
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	17.0	52.0	190
Commercial milk (locally produced)	Bq L <sup>-1</sup>	10.0	30.0	87
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	--	--	--
Beef	Bq kg <sup>-1</sup>	2.60	16.0	97
Leafy vegetables	Bq kg <sup>-1</sup> fresh mass	20.0	61.0	180
Cottage Cheese	Bq kg <sup>-1</sup>	5.0	28.0	170
Eggs	Bq kg <sup>-1</sup>	8.6	34.0	140
Mother's milk*	Bq L <sup>-1</sup>	0.33	2.2	13.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Jonesville**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.007	0.012	0.022
Pasture grass	Bq kg <sup>-1</sup> dry mass	40	120	380
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	2.2	7.4	29
Commercial milk (locally produced)	Bq L <sup>-1</sup>	1.3	4.3	14
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	6	34	150
Beef	Bq kg <sup>-1</sup>	0.32	2.3	16
Leafy vegetables	Bq kg <sup>-1</sup> fresh mass	2.6	8.5	28
Cottage Cheese	Bq kg <sup>-1</sup>	0.6	4.1	29
Eggs	Bq kg <sup>-1</sup>	1.2	4.8	23
Mother's milk*	Bq L <sup>-1</sup>	0.16	1.3	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Karns**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.034	0.050	0.073
Pasture grass	Bq kg <sup>-1</sup> dry mass	160	440	1200
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	8.5	26.0	82
Commercial milk (locally produced)	Bq L <sup>-1</sup>	5.1	15.0	44
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	25	120	460
Beef	Bq kg <sup>-1</sup>	1.30	7.4	48
Leafy vegetables	Bq kg <sup>-1</sup> fresh mass	9.9	30.0	87
Cottage Cheese	Bq kg <sup>-1</sup>	2.4	14.0	84
Eggs	Bq kg <sup>-1</sup>	4.2	17.0	69
Mother's milk*	Bq L <sup>-1</sup>	0.25	1.8	12.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Kingston**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.025	0.037	0.057
Pasture grass	Bq kg <sup>-1</sup> dry mass	110	320	850
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	5.9	19.0	64
Commercial milk (locally produced)	Bq L <sup>-1</sup>	3.6	11.0	32
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	20	88	330
Beef	Bq kg <sup>-1</sup>	0.90	5.5	33
Leafy vegetables	Bq kg <sup>-1</sup> fresh mass	7.4	22.0	66
Cottage Cheese	Bq kg <sup>-1</sup>	1.6	10.0	68
Eggs	Bq kg <sup>-1</sup>	2.9	12.0	54
Mother's milk*	Bq L <sup>-1</sup>	0.22	1.6	11.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Knoxville**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.015	0.024	0.036
Pasture grass	Bq kg <sup>-1</sup> dry mass	59	160	440
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	2.9	9.6	33
Commercial milk (locally produced)	Bq L <sup>-1</sup>	1.9	5.6	16
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	10	44	170
Beef	Bq kg <sup>-1</sup>	0.48	2.9	17
Leafy vegetables	Bq kg <sup>-1</sup> fresh mass	3.9	11.0	34
Cottage Cheese	Bq kg <sup>-1</sup>	1.0	5.3	35
Eggs	Bq kg <sup>-1</sup>	1.5	6.4	26
Mother's milk*	Bq L <sup>-1</sup>	0.19	1.5	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Lake City**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.006	0.010	0.016
Pasture grass	Bq kg <sup>-1</sup> dry mass	28	80	210
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	1.3	4.7	16
Commercial milk (locally produced)	Bq L <sup>-1</sup>	0.9	2.8	8
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	5	22	92
Beef	Bq kg <sup>-1</sup>	0.23	1.4	9
Leafy vegetables	Bq kg <sup>-1</sup> fresh mass	1.7	5.4	16
Cottage Cheese	Bq kg <sup>-1</sup>	0.4	2.5	17
Eggs	Bq kg <sup>-1</sup>	0.7	3.1	13
Mother's milk*	Bq L <sup>-1</sup>	0.15	1.3	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Lawnville/Gallaher**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.055	0.080	0.120
Pasture grass	Bq kg <sup>-1</sup> dry mass	330	820	2100
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	18.0	49.0	170
Commercial milk (locally produced)	Bq L <sup>-1</sup>	11.0	29.0	75
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	51	220	920
Beef	Bq kg <sup>-1</sup>	2.40	15.0	84
Leafy vegetables	Bq kg <sup>-1</sup> fresh mass	21.0	57.0	150
Cottage Cheese	Bq kg <sup>-1</sup>	4.9	26.0	180
Eggs	Bq kg <sup>-1</sup>	8.8	32.0	130
Mother's milk*	Bq L <sup>-1</sup>	0.31	2.2	13.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Lenoir City**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.018	0.029	0.047
Pasture grass	Bq kg <sup>-1</sup> dry mass	95	250	670
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	5.1	15.0	56
Commercial milk (locally produced)	Bq L <sup>-1</sup>	3.0	8.6	25
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	--	--	--
Beef	Bq kg <sup>-1</sup>	0.68	4.5	27
Leafy vegetables	Bq kg <sup>-1</sup> fresh mass	6.3	17.0	49
Cottage Cheese	Bq kg <sup>-1</sup>	1.4	7.8	55
Eggs	Bq kg <sup>-1</sup>	2.5	9.7	47
Mother's milk*	Bq L <sup>-1</sup>	0.19	1.5	11.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Loudon**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.019	0.030	0.047
Pasture grass	Bq kg <sup>-1</sup> dry mass	86	240	680
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	4.4	14.0	52
Commercial milk (locally produced)	Bq L <sup>-1</sup>	2.8	8.3	25
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	14	65	260
Beef	Bq kg <sup>-1</sup>	0.69	4.2	27
Leafy vegetables	Bq kg <sup>-1</sup> fresh mass	5.5	17.0	50
Cottage Cheese	Bq kg <sup>-1</sup>	1.3	7.7	49
Eggs	Bq kg <sup>-1</sup>	2.3	9.4	39
Mother's milk*	Bq L <sup>-1</sup>	0.20	1.5	11.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Louisville**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.011	0.019	0.031
Pasture grass	Bq kg <sup>-1</sup> dry mass	43	130	380
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	2.2	7.7	29
Commercial milk (locally produced)	Bq L <sup>-1</sup>	1.5	4.6	14
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	7	36	160
Beef	Bq kg <sup>-1</sup>	0.37	2.3	14
Leafy vegetables	Bq kg <sup>-1</sup> fresh mass	2.9	9.0	29
Cottage Cheese	Bq kg <sup>-1</sup>	0.7	4.2	29
Eggs	Bq kg <sup>-1</sup>	1.2	5.1	24
Mother's milk*	Bq L <sup>-1</sup>	0.17	1.4	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Maryville**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.007	0.013	0.023
Pasture grass	Bq kg <sup>-1</sup> dry mass	26	80	240
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	1.3	4.7	18
Commercial milk (locally produced)	Bq L <sup>-1</sup>	0.9	2.8	9
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	4	22	91
Beef	Bq kg <sup>-1</sup>	0.23	1.3	9
Leafy vegetables	Bq kg <sup>-1</sup> fresh mass	1.7	5.6	17
Cottage Cheese	Bq kg <sup>-1</sup>	0.4	2.5	16
Eggs	Bq kg <sup>-1</sup>	0.7	3.1	14
Mother's milk*	Bq L <sup>-1</sup>	0.16	1.3	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Norwood**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.010	0.016	0.028
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	51	160	490
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	3.0	9.4	37
Commercial milk (locally produced)	Bq L <sup>-1</sup>	1.7	5.6	19
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	9	44	190
Beef	Bq kg <sup>-1</sup>	0.44	2.8	18
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	3.4	11.0	37
Cottage Cheese	Bq kg <sup>-1</sup>	0.8	5.1	34
Eggs	Bq kg <sup>-1</sup>	1.4	6.3	29
Mother's milk*	Bq L <sup>-1</sup>	0.17	1.4	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Oakdale**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.005	0.009	0.016
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	27	79	240
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	1.4	4.6	18
Commercial milk (locally produced)	Bq L <sup>-1</sup>	0.9	2.7	9
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	5	22	90
Beef	Bq kg <sup>-1</sup>	0.22	1.4	9
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	1.8	5.4	18
Cottage Cheese	Bq kg <sup>-1</sup>	0.5	2.6	18
Eggs	Bq kg <sup>-1</sup>	0.7	3.1	14
Mother's milk*	Bq L <sup>-1</sup>	0.15	1.3	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Oliver Springs**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.007	0.012	0.022
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	38	120	400
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	2.0	7.1	29
Commercial milk (locally produced)	Bq L <sup>-1</sup>	1.3	4.2	15
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	7	33	140
Beef	Bq kg <sup>-1</sup>	0.30	2.2	14
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	2.4	8.3	30
Cottage Cheese	Bq kg <sup>-1</sup>	0.7	3.9	27
Eggs	Bq kg <sup>-1</sup>	1.0	4.7	22
Mother's milk*	Bq L <sup>-1</sup>	0.16	1.3	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: OR High School Area**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.024	0.037	0.053
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	130	360	940
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	--	--	--
Commercial milk (locally produced)	Bq L <sup>-1</sup>	--	--	--
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	--	--	--
Beef	Bq kg <sup>-1</sup>	--	--	--
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	8.5	25.0	70
Cottage Cheese	Bq kg <sup>-1</sup>	--	--	--
Eggs	Bq kg <sup>-1</sup>	--	--	--
Mother's milk*	Bq L <sup>-1</sup>	0.22	1.7	11.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: OR Scarborough**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.041	0.060	0.089
Pasture grass	Bq kg <sup>-1</sup> dry mass	240	650	1700
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	--	--	--
Commercial milk (locally produced)	Bq L <sup>-1</sup>	--	--	--
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	--	--	--
Beef	Bq kg <sup>-1</sup>	--	--	--
Leafy vegetables	Bq kg <sup>-1</sup> fresh mass	15.0	45.0	130
Cottage Cheese	Bq kg <sup>-1</sup>	--	--	--
Eggs	Bq kg <sup>-1</sup>	--	--	--
Mother's milk*	Bq L <sup>-1</sup>	0.27	2.0	12.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: OR Townsite**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.023	0.034	0.050
Pasture grass	Bq kg <sup>-1</sup> dry mass	120	330	850
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	--	--	--
Commercial milk (locally produced)	Bq L <sup>-1</sup>	--	--	--
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	--	--	--
Beef	Bq kg <sup>-1</sup>	--	--	--
Leafy vegetables	Bq kg <sup>-1</sup> fresh mass	7.7	22.0	65
Cottage Cheese	Bq kg <sup>-1</sup>	--	--	--
Eggs	Bq kg <sup>-1</sup>	--	--	--
Mother's milk*	Bq L <sup>-1</sup>	0.21	1.6	11.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Rockford**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.012	0.019	0.029
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	45	130	360
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	2.5	7.6	27
Commercial milk (locally produced)	Bq L <sup>-1</sup>	1.5	4.4	14
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	7	35	140
Beef	Bq kg <sup>-1</sup>	0.39	2.3	14
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	3.0	8.8	28
Cottage Cheese	Bq kg <sup>-1</sup>	0.7	4.2	28
Eggs	Bq kg <sup>-1</sup>	1.3	5.0	21
Mother's milk*	Bq L <sup>-1</sup>	0.18	1.4	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Rockwood**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.012	0.018	0.029
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	51	140	410
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	2.7	8.3	31
Commercial milk (locally produced)	Bq L <sup>-1</sup>	1.6	5.0	15
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	9	39	150
Beef	Bq kg <sup>-1</sup>	0.42	2.5	16
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	3.3	9.9	31
Cottage Cheese	Bq kg <sup>-1</sup>	0.8	4.5	30
Eggs	Bq kg <sup>-1</sup>	1.4	5.5	23
Mother's milk*	Bq L <sup>-1</sup>	0.17	1.4	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Solway**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.052	0.074	0.100
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	280	710	1800
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	14.0	42.0	140
Commercial milk (locally produced)	Bq L <sup>-1</sup>	8.9	24.0	69
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	44	200	720
Beef	Bq kg <sup>-1</sup>	2.20	13.0	73
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	17.0	48.0	140
Cottage Cheese	Bq kg <sup>-1</sup>	4.2	23.0	140
Eggs	Bq kg <sup>-1</sup>	7.3	27.0	110
Mother's milk*	Bq L <sup>-1</sup>	0.30	2.1	13.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Sugar Grove**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.020	0.031	0.046
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	110	300	800
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	5.8	18.0	64
Commercial milk (locally produced)	Bq L <sup>-1</sup>	3.5	10.0	30
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	18	82	320
Beef	Bq kg <sup>-1</sup>	0.92	5.4	33
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	7.0	21.0	60
Cottage Cheese	Bq kg <sup>-1</sup>	1.7	9.5	64
Eggs	Bq kg <sup>-1</sup>	3.0	12.0	49
Mother's milk*	Bq L <sup>-1</sup>	0.21	1.6	11.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Sweetwater**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.009	0.015	0.025
Pasture grass	Bq kg <sup>-1</sup> dry mass	31	97	290
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	1.6	5.7	22
Commercial milk (locally produced)	Bq L <sup>-1</sup>	1.0	3.4	11
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	5	26	110
Beef	Bq kg <sup>-1</sup>	0.28	1.6	11
Leafy vegetables	Bq kg <sup>-1</sup> fresh mass	2.1	6.6	22
Cottage Cheese	Bq kg <sup>-1</sup>	0.5	3.0	21
Eggs	Bq kg <sup>-1</sup>	0.9	3.7	17
Mother's milk*	Bq L <sup>-1</sup>	0.16	1.4	10.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Wartburg**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.002	0.004	0.008
Pasture grass	Bq kg <sup>-1</sup> dry mass	9	35	120
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	0.5	2.0	8
Commercial milk (locally produced)	Bq L <sup>-1</sup>	0.3	1.2	4
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	2	9	46
Beef	Bq kg <sup>-1</sup>	0.08	0.6	4
Leafy vegetables	Bq kg <sup>-1</sup> fresh mass	0.6	2.3	9
Cottage Cheese	Bq kg <sup>-1</sup>	0.2	1.1	8
Eggs	Bq kg <sup>-1</sup>	0.2	1.3	7
Mother's milk*	Bq L <sup>-1</sup>	0.13	1.2	9.8

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**Location: Woodland**

Environmental media or food product	Units	13 years-average concentration		
		lower limit	central estimate	upper limit
Air (all physico-chemical forms)	Bq m <sup>-3</sup>	0.037	0.055	0.078
Pasture grass	Bq kg <sup>-1</sup> <sub>dry mass</sub>	210	550	1400
Backyard cow milk (locally produced)	Bq L <sup>-1</sup>	--	--	--
Commercial milk (locally produced)	Bq L <sup>-1</sup>	--	--	--
Commercial milk (regional mixed)	Bq L <sup>-1</sup>	2.2	5.8	16
Goat milk (locally produced)	Bq L <sup>-1</sup>	--	--	--
Beef	Bq kg <sup>-1</sup>	--	--	--
Leafy vegetables	Bq kg <sup>-1</sup> <sub>fresh mass</sub>	13.0	38.0	100
Cottage Cheese	Bq kg <sup>-1</sup>	--	--	--
Eggs	Bq kg <sup>-1</sup>	--	--	--
Mother's milk*	Bq L <sup>-1</sup>	0.26	1.9	12.0

\*Mother on Diet 3 - Regionally mixed commercial milk + inhalation

**APPENDIX 11C**

**DETAILED RESULTS OF THE  
DOSE RECONSTRUCTION FOR IODINE-131**

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## APPENDIX 11C

### DETAILED RESULTS OF THE DOSE RECONSTRUCTION FOR IODINE-131

This Appendix presents the estimated thyroid doses, excess lifetime risks, and relative risks of thyroid cancer from exposure to <sup>131</sup>I released from the X-10 Radioactive Lanthanum Processing facility located in Oak Ridge, Tennessee. These results represent the effects of both routine releases and the April 29, 1954, accident. In addition, this Appendix presents estimates for the probability of causation, which is defined as the probability that a manifested thyroid cancer was induced by the person's exposure to <sup>131</sup>I released from X-10.

The dose is defined as the energy deposited in the thyroid tissue from the decay of <sup>131</sup>I accumulated in the thyroid. The deposited energy induces modifications in the thyroid cells that may manifest as thyroid cancer or other abnormalities. The risk values represent the probability (or the chance) that an exposed individual will contract a thyroid cancer during his or her remaining lifetime. The excess lifetime risks presented in this Appendix represent the radiation-induced thyroid cancer incidence in excess of the natural background incidence of thyroid cancer. The relative difference between the incidence of cancer in the case of exposure and the incidence of cancer in the absence of exposure (background incidence) when divided by the background incidence of cancer provides the quantity called "relative risk." The relative risk for a given individual represents the factor by which his or her background incidence of cancer has been increased by exposure to <sup>131</sup>I released from X-10.

The results are presented as ranges of values, which at the 95<sup>th</sup> percent level of confidence<sup>1</sup> encompass the true but unknown doses or risks for an exposed individual. Central values (50<sup>th</sup> percentiles) are also presented.

The results are presented separately for each of the 41 locations of interest (Appendix 11A) within a 38-km radius around the RaLa facility. Doses and risks are estimated for reference individuals of nine age categories exposed at these locations. The difference between genders is addressed explicitly. For each location and each exposed individual, doses from the most relevant exposure pathways are included. At some locations, not all the exposure pathways are applicable. For instance, no cows were present in downtown Oak Ridge during 1940s or 1950s. For these locations a dash "-" is shown in the tables, to indicate that the exposure pathway is not valid for that particular location. Also, for some individuals, exposure from ingestion of mother's milk is zero, meaning that even though infants living at that location were breast-fed, mother's milk was not contaminated because <sup>131</sup>I was not released from X-10 in the year when the infant was born. For similar reasons, some of the doses from prenatal exposures are zero.

<sup>1</sup> The ranges cover a 95% subjective confidence interval. The confidence intervals are called "subjective" because they are based on assumptions made using expert judgement and on professional analysis of the exposure situation. Other investigators may come to slightly different results, but the final conclusions would not change significantly.

Most of the doses are estimated based on the ingestion of locally produced food items. However, doses are also estimated for the specific case of ingestion of commercial milk representative of the entire affected region. The latter dose estimates are based on a regionally averaged concentration in milk.

Individuals living around X-10 may have been exposed via more than one exposure pathway at a time. Inhalation of contaminated air, for instance, is an exposure pathway that affected everyone in the contaminated area. Three special exposure scenarios are designed to match the most likely dietary habits and lifestyles in the vicinity of the Oak Ridge Reservation. The first exposure scenario refers to individuals living in a "rural farm" setting: that is, they own land and livestock and produce their own "backyard" cow milk, cheese, vegetables, and eggs. The intake for this exposure scenario is obtained by adding the intakes from inhalation and from ingestion of backyard cow's milk, beef, leafy vegetables, eggs, and cheese. The doses and risks for this exposure scenario are reported under the label "*diet 1*."

The second exposure scenario refers to individuals in a rural area who do not own their own dairy cows. However, they have some land and can produce their own vegetables and eggs, but they purchase the necessary milk and cheese from nearby farms. The intake for this exposure scenario is obtained by adding the intakes from inhalation and from ingestion of locally produced commercial milk, beef, leafy vegetables, eggs, and cheese. The doses and risks for this exposure scenario are reported under the label "*diet 2*."

The third scenario refers to individuals in a more "urban" setting, who do not produce their own food products. They buy milk and food products from the grocery store. The intake for this exposure scenario is obtained by adding the intakes from ingestion of regionally averaged commercial milk and from inhalation. The contribution to the total thyroid dose and risk of cancer of other regionally mixed food products is negligible compared to the contribution of ingestion of milk. The doses and risks for this exposure scenario are reported under the label "*diet 3*."

Given that the doses and risks from ingestion of goat's milk are substantially larger than the doses and risks from any other exposure pathway, these results are reported separately under the label "*diet 4*".

Typically, pregnant women and lactating mothers are considered to be on "*diet 1*," composed of backyard cow's milk, all other nonmilk food products, and inhalation. For locations where backyard cows are not present (e.g., the city of Oak Ridge), pregnant women and lactating mothers are considered to be on "*diet 3*," composed only of regionally mixed milk and inhalation. For a complete list of locations, and for the rationale on the choices of the exposure pathways at a given location, the reader should consult Appendix 11A. Figure 11-C.1 shows the locations of the reference locations used in the dose reconstruction for <sup>131</sup>I.

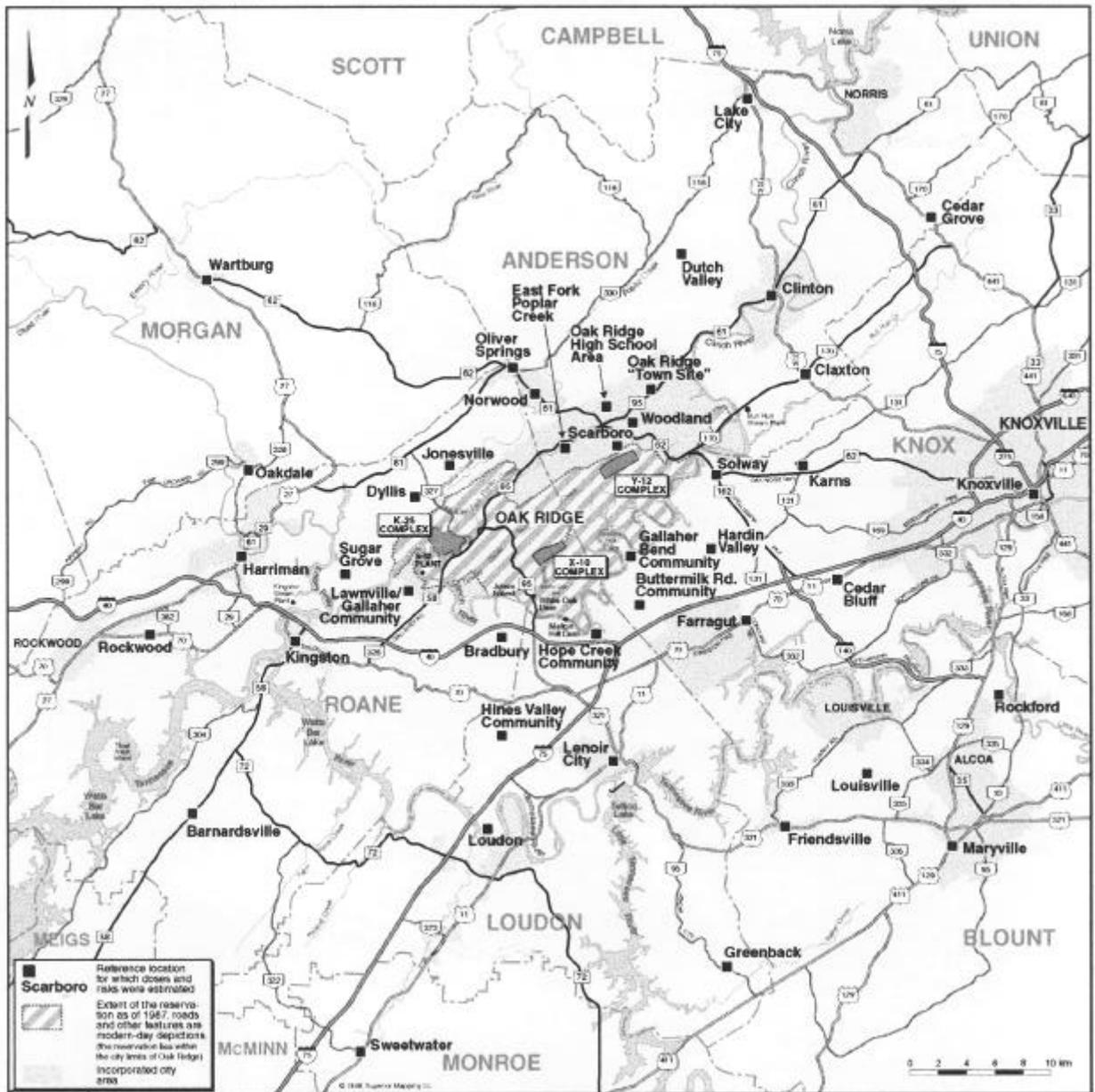


Figure 11C.1: Map Showing the 41 Reference Locations for the  $^{131}\text{I}$  Dose Reconstruction

Index of page numbers for results within Appendix 11-C  
for specific combinations of location and birth year

Location	Year of Birth								
	1920	1930	1935	1940	1944	1950	1952	1954	1956
Barnardville	73	155	237	319	401	483	565	647	729
Bradbury	7	89	171	253	335	417	499	581	663
Buttermilk Rd.	15	97	179	261	343	425	507	589	671
Cedar Bluff	55	137	219	301	383	465	547	629	711
Cedar Grove	87	169	251	333	415	497	579	661	743
Claxton	59	141	223	305	387	469	551	633	715
Clinton	63	145	227	309	391	473	555	637	719
Dutch Valley	61	143	225	307	389	471	553	635	717
Dyllis	23	105	187	269	351	433	515	597	679
EFPC	11	93	175	257	339	421	503	585	667
Farragut	43	125	207	289	371	453	535	617	699
Friendsville	65	147	229	311	393	475	557	639	721
Gallaher Bend	9	91	173	255	337	419	501	583	665
Greenback	75	157	239	321	403	485	567	649	731
Hardin Valley	31	113	195	277	359	441	523	605	687
Harriman	53	135	217	299	381	463	545	627	709
Hines Valley	41	123	205	287	369	451	533	615	697
Hope Creek	13	95	177	259	341	423	505	587	669
Jonesville	17	99	181	263	345	427	509	591	673
Karns	49	131	213	295	377	459	541	623	705
Kingston	47	129	211	293	375	457	539	621	703
Knoxville	83	165	247	329	411	493	575	657	739
Lake City	79	161	243	325	407	489	571	653	735
Lawnville/Gallaher	21	103	185	267	349	431	513	595	677
Lenoir City	45	127	209	291	373	455	537	619	701
Loudon	51	133	215	297	379	461	543	625	707
Louisville	71	153	235	317	399	481	563	645	727
Maryville	85	167	249	331	413	495	577	659	741
Norwood	27	109	191	273	355	437	519	601	683
Oakdale	57	139	221	303	385	467	549	631	713
Oliver Springs	33	115	197	279	361	443	525	607	689
OR High School Area	25	107	189	271	353	435	517	599	681
OR Scarboro	19	101	183	265	347	429	511	593	675
OR Townsite	39	121	203	285	367	449	531	613	695
Rockford	77	159	241	323	405	487	569	651	733
Rockwood	69	151	233	315	397	479	561	643	725
Solway	35	117	199	281	363	445	527	609	691
Sugar Grove	37	119	201	283	365	447	529	611	693
Sweetwater	81	163	245	327	409	491	573	655	737
Wartburg	67	149	231	313	395	477	559	641	723
Woodland	29	111	193	275	357	439	521	603	685

**Location: Bradbury**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.4	7.2	41
Commercial Milk (locally produced)	0.23	1.5	10
Commercial Milk (regionally mixed)	0.037	0.21	1.3
Goat Milk (locally produced)	2.4	18	120
Beef (locally produced)	0.0036	0.06	1.2
Leafy Vegetables (locally produced)	0.0013	0.015	0.13
Eggs (locally produced)	0.087	0.61	3.8
Cottage Cheese (locally produced)	0.0033	0.036	0.37
Inhalation	0.063	0.2	0.7
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.7	8.4	46
Diet 2	0.5	2.7	15
Diet 3	0.12	0.43	2

Excess Lifetime Risk [ ]			
Diet 1	2.0E-06	3.2E-05	4.8E-04
Diet 2	6.3E-07	1.0E-05	1.3E-04
Diet 3	1.5E-07	1.6E-06	1.7E-05
Diet 4	4.4E-06	7.4E-05	1.0E-03

Relative Risk [ ]			
Diet 1	1.0013	1.012	1.14
Diet 2	1.00041	1.0037	1.051
Diet 3	1.000084	1.00063	1.0062
Diet 4	1.0026	1.026	1.4

Probability of Causation [%]			
Diet 1	0.125	1.147	12.14
Diet 2	0.041	0.373	4.86
Diet 3	0.008	0.063	0.61
Diet 4	0.263	2.512	28.51

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.7	8.9	49
Commercial Milk (locally produced)	0.29	1.9	12
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	3.3	24	160
Beef (locally produced)	0.0061	0.093	2
Leafy Vegetables (locally produced)	0.0014	0.015	0.14
Eggs (locally produced)	0.094	0.66	4.5
Cottage Cheese (locally produced)	0.0036	0.036	0.39
Inhalation	0.076	0.26	0.88
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2	10	56
Diet 2	0.62	3.2	18
Diet 3	0.14	0.55	2.3

Excess Lifetime Risk [ ]			
Diet 1	2.2E-07	1.2E-05	3.5E-04
Diet 2	8.8E-08	3.7E-06	1.4E-04
Diet 3	1.8E-08	6.7E-07	1.8E-05
Diet 4	5.3E-07	2.6E-05	1.1E-03

Relative Risk [ ]			
Diet 1	1.00045	1.0095	1.28
Diet 2	1.00013	1.003	1.086
Diet 3	1.000027	1.00051	1.012
Diet 4	1.00073	1.023	1.75

Probability of Causation [%]			
Diet 1	0.045	0.940	21.63
Diet 2	0.013	0.300	7.88
Diet 3	0.003	0.051	1.20
Diet 4	0.073	2.257	42.69

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.7	9.2	48
Commercial Milk (locally produced)	0.32	1.9	12
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	2.8	22	160
Beef (locally produced)	0.0041	0.072	1.5
Leafy Vegetables (locally produced)	0.0016	0.019	0.16
Eggs (locally produced)	0.12	0.77	4.5
Cottage Cheese (locally produced)	0.0045	0.044	0.43
Inhalation	0.074	0.25	0.83
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2	10	56
Diet 2	0.63	3.3	18
Diet 3	0.14	0.48	2.1

Excess Lifetime Risk [ ]			
Diet 1	2.2E-06	4.0E-05	5.8E-04
Diet 2	7.7E-07	1.2E-05	1.6E-04
Diet 3	1.6E-07	1.8E-06	1.8E-05
Diet 4	5.1E-06	8.7E-05	1.4E-03

Relative Risk [ ]			
Diet 1	1.0016	1.014	1.16
Diet 2	1.00049	1.0047	1.057
Diet 3	1.0001	1.00069	1.0067
Diet 4	1.003	1.032	1.49

Probability of Causation [%]			
Diet 1	0.164	1.414	13.72
Diet 2	0.049	0.467	5.37
Diet 3	0.010	0.069	0.66
Diet 4	0.302	3.055	33.02

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2	11	58
Commercial Milk (locally produced)	0.4	2.3	14
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	3.9	30	200
Beef (locally produced)	0.0068	0.12	2.5
Leafy Vegetables (locally produced)	0.0017	0.019	0.16
Eggs (locally produced)	0.12	0.84	5.3
Cottage Cheese (locally produced)	0.0045	0.044	0.44
Inhalation	0.094	0.33	1.1
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2.3	12	66
Diet 2	0.78	4	20
Diet 3	0.15	0.61	2.5

Excess Lifetime Risk [ ]			
Diet 1	2.8E-07	1.5E-05	3.9E-04
Diet 2	9.8E-08	4.8E-06	1.6E-04
Diet 3	2.0E-08	7.4E-07	1.9E-05
Diet 4	6.6E-07	3.4E-05	1.3E-03

Relative Risk [ ]			
Diet 1	1.00051	1.011	1.32
Diet 2	1.00016	1.0036	1.11
Diet 3	1.000031	1.00057	1.013
Diet 4	1.00094	1.029	1.85

Probability of Causation [%]			
Diet 1	0.051	1.112	24.45
Diet 2	0.016	0.359	9.64
Diet 3	0.003	0.057	1.27
Diet 4	0.094	2.840	45.81

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.36	1.9	11
Commercial Milk (locally produced)	0.06	0.4	2.7
Commercial Milk (regionally mixed)	0.037	0.21	1.3
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.00097	0.016	0.35
Leafy Vegetables (locally produced)	0.00034	0.0039	0.033
Eggs (locally produced)	0.023	0.16	1
Cottage Cheese (locally produced)	0.0009	0.0092	0.096
Inhalation	0.016	0.055	0.19
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.42	2.2	12
Diet 2	0.13	0.69	3.9
Diet 3	0.06	0.26	1.5

Excess Lifetime Risk [ ]			
Diet 1	5.0E-07	8.0E-06	1.2E-04
Diet 2	1.7E-07	2.6E-06	3.5E-05
Diet 3	7.7E-08	9.9E-07	1.3E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.00031	1.0031	1.035
Diet 2	1.00011	1.00097	1.012
Diet 3	1.000046	1.00039	1.0043
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.031	0.307	3.33
Diet 2	0.011	0.097	1.21
Diet 3	0.005	0.039	0.43
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.4	2.3	13
Commercial Milk (locally produced)	0.076	0.49	3.2
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0016	0.025	0.55
Leafy Vegetables (locally produced)	0.00036	0.0039	0.037
Eggs (locally produced)	0.025	0.17	1.2
Cottage Cheese (locally produced)	0.001	0.0091	0.095
Inhalation	0.019	0.071	0.24
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.48	2.6	14
Diet 2	0.16	0.84	4.7
Diet 3	0.075	0.33	1.7

Excess Lifetime Risk [ ]			
Diet 1	5.4E-08	3.1E-06	9.9E-05
Diet 2	2.2E-08	1.0E-06	3.5E-05
Diet 3	1.0E-08	4.1E-07	1.3E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.00011	1.0024	1.079
Diet 2	1.000033	1.00077	1.024
Diet 3	1.000013	1.0003	1.0094
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.011	0.236	7.28
Diet 2	0.003	0.077	2.33
Diet 3	0.001	0.030	0.93
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.95	5.1	29
Commercial Milk (locally produced)	0.17	1	7.4
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0024	0.043	0.96
Leafy Vegetables (locally produced)	0.001	0.011	0.097
Eggs (locally produced)	0.065	0.44	2.8
Cottage Cheese (locally produced)	0.0026	0.025	0.27
Inhalation	0.045	0.15	0.51
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.1	5.9	34
Diet 2	0.37	1.8	11
Diet 3	0.097	0.37	1.8

Excess Lifetime Risk [ ]			
Diet 1	1.3E-06	2.2E-05	3.5E-04
Diet 2	4.7E-07	6.9E-06	9.9E-05
Diet 3	1.2E-07	1.4E-06	1.6E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.00082	1.0085	1.091
Diet 2	1.00029	1.0026	1.035
Diet 3	1.000071	1.00054	1.0054
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.082	0.843	8.34
Diet 2	0.029	0.263	3.35
Diet 3	0.007	0.054	0.53
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.1	36
Commercial Milk (locally produced)	0.22	1.3	9.3
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.004	0.067	1.5
Leafy Vegetables (locally produced)	0.001	0.011	0.099
Eggs (locally produced)	0.069	0.47	3.2
Cottage Cheese (locally produced)	0.0026	0.026	0.26
Inhalation	0.054	0.19	0.62
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.3	7	40
Diet 2	0.45	2.2	13
Diet 3	0.12	0.47	2.1

Excess Lifetime Risk [ ]			
Diet 1	1.5E-07	8.3E-06	2.5E-04
Diet 2	5.7E-08	2.8E-06	9.3E-05
Diet 3	1.5E-08	5.6E-07	1.5E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.0003	1.0064	1.18
Diet 2	1.000087	1.0021	1.058
Diet 3	1.000021	1.00043	1.011
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.030	0.635	15.06
Diet 2	0.009	0.206	5.44
Diet 3	0.002	0.043	1.12
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.92	5.1	29
Commercial Milk (locally produced)	0.17	1	7.3
Commercial Milk (regionally mixed)	0.037	0.21	1.3
Goat Milk (locally produced)	1.6	12	88
Beef (locally produced)	0.0024	0.042	0.9
Leafy Vegetables (locally produced)	0.001	0.011	0.092
Eggs (locally produced)	0.064	0.43	2.7
Cottage Cheese (locally produced)	0.0026	0.024	0.25
Inhalation	0.046	0.15	0.52
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.1	5.8	34
Diet 2	0.36	1.8	11
Diet 3	0.098	0.37	1.8

Excess Lifetime Risk [ ]			
Diet 1	1.4E-06	2.2E-05	3.5E-04
Diet 2	4.4E-07	6.8E-06	9.3E-05
Diet 3	1.2E-07	1.4E-06	1.6E-05
Diet 4	3.0E-06	5.0E-05	7.8E-04

Relative Risk [ ]			
Diet 1	1.00079	1.0084	1.091
Diet 2	1.00028	1.0027	1.032
Diet 3	1.00007	1.00055	1.0053
Diet 4	1.0018	1.018	1.29

Probability of Causation [%]			
Diet 1	0.079	0.829	8.32
Diet 2	0.027	0.266	3.12
Diet 3	0.007	0.054	0.53
Diet 4	0.176	1.740	22.25

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**  
**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6	37
Commercial Milk (locally produced)	0.21	1.3	8.9
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	2.2	17	110
Beef (locally produced)	0.0038	0.066	1.4
Leafy Vegetables (locally produced)	0.001	0.011	0.094
Eggs (locally produced)	0.067	0.47	3
Cottage Cheese (locally produced)	0.0026	0.026	0.26
Inhalation	0.054	0.19	0.63
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.3	6.9	40
Diet 2	0.44	2.2	12
Diet 3	0.12	0.48	2.1

Excess Lifetime Risk [ ]			
Diet 1	1.3E-07	8.4E-06	2.3E-04
Diet 2	5.4E-08	2.8E-06	9.2E-05
Diet 3	1.5E-08	5.7E-07	1.5E-05
Diet 4	3.3E-07	1.9E-05	7.5E-04

Relative Risk [ ]			
Diet 1	1.00031	1.0063	1.18
Diet 2	1.000087	1.002	1.058
Diet 3	1.000021	1.00043	1.011
Diet 4	1.00049	1.016	1.49

Probability of Causation [%]			
Diet 1	0.031	0.631	15.07
Diet 2	0.009	0.197	5.46
Diet 3	0.002	0.043	1.12
Diet 4	0.049	1.599	32.72

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.12	0.68	4.4
Commercial Milk (locally produced)	0.024	0.15	1
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.21	1.8	15
Beef (locally produced)	0.00033	0.0061	0.13
Leafy Vegetables (locally produced)	0.00013	0.0015	0.014
Eggs (locally produced)	0.0082	0.058	0.4
Cottage Cheese (locally produced)	0.00033	0.0035	0.043
Inhalation	0.0066	0.022	0.085
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.16	0.8	4.9
Diet 2	0.05	0.26	1.6
Diet 3	0.05	0.23	1.4

Excess Lifetime Risk [ ]			
Diet 1	2.0E-07	3.1E-06	5.4E-05
Diet 2	6.6E-08	9.9E-07	1.6E-05
Diet 3	5.9E-08	8.5E-07	1.3E-05
Diet 4	4.2E-07	6.8E-06	1.2E-04

Relative Risk [ ]			
Diet 1	1.00011	1.0011	1.015
Diet 2	1.00004	1.00036	1.0048
Diet 3	1.000036	1.00034	1.0039
Diet 4	1.00022	1.0024	1.047

Probability of Causation [%]			
Diet 1	0.011	0.112	1.43
Diet 2	0.004	0.036	0.48
Diet 3	0.004	0.034	0.39
Diet 4	0.022	0.239	4.52

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.16	0.84	5.1
Commercial Milk (locally produced)	0.027	0.19	1.3
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.31	2.4	19
Beef (locally produced)	0.00052	0.0097	0.2
Leafy Vegetables (locally produced)	0.00013	0.0015	0.016
Eggs (locally produced)	0.0095	0.063	0.47
Cottage Cheese (locally produced)	0.0003	0.0036	0.045
Inhalation	0.0085	0.028	0.11
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.19	0.97	5.9
Diet 2	0.063	0.32	2
Diet 3	0.06	0.28	1.6

Excess Lifetime Risk [ ]			
Diet 1	1.9E-08	1.2E-06	3.9E-05
Diet 2	7.8E-09	3.7E-07	1.4E-05
Diet 3	8.4E-09	3.4E-07	1.3E-05
Diet 4	5.4E-08	2.6E-06	1.1E-04

Relative Risk [ ]			
Diet 1	1.000039	1.00095	1.028
Diet 2	1.000012	1.00031	1.009
Diet 3	1.000011	1.00026	1.0081
Diet 4	1.000069	1.0024	1.073

Probability of Causation [%]			
Diet 1	0.004	0.095	2.69
Diet 2	0.001	0.031	0.89
Diet 3	0.001	0.026	0.81
Diet 4	0.007	0.235	6.75

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.037	0.21	1.3
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0018	0.019	0.18
Inhalation	0.033	0.11	0.37
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.083	0.32	1.7

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0E-07	1.2E-06	1.5E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.000061	1.00049	1.0049
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.006	0.049	0.49
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0019	0.019	0.19
Inhalation	0.04	0.14	0.47
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.1	0.41	2

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.3E-08	5.0E-07	1.5E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.000018	1.00037	1.011
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.002	0.037	1.04
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.98	4.8	25
Commercial Milk (locally produced)	0.18	1	6.9
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	1.5	12	83
Beef (locally produced)	0.0022	0.041	0.79
Leafy Vegetables (locally produced)	0.00099	0.011	0.083
Eggs (locally produced)	0.067	0.41	2.5
Cottage Cheese (locally produced)	0.0026	0.024	0.22
Inhalation	0.045	0.14	0.5
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.2	5.5	29
Diet 2	0.36	1.8	9.8
Diet 3	0.097	0.36	1.8

Excess Lifetime Risk [ ]			
Diet 1	1.3E-06	2.1E-05	3.4E-04
Diet 2	4.2E-07	6.6E-06	8.8E-05
Diet 3	1.2E-07	1.4E-06	1.6E-05
Diet 4	3.0E-06	4.5E-05	7.3E-04

Relative Risk [ ]			
Diet 1	1.00088	1.008	1.082
Diet 2	1.00027	1.0025	1.03
Diet 3	1.000073	1.00054	1.0053
Diet 4	1.0017	1.017	1.24

Probability of Causation [%]			
Diet 1	0.088	0.793	7.60
Diet 2	0.027	0.253	2.93
Diet 3	0.007	0.054	0.53
Diet 4	0.172	1.673	19.13

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.2	5.7	30
Commercial Milk (locally produced)	0.21	1.2	8.5
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	2.1	16	100
Beef (locally produced)	0.0035	0.065	1.3
Leafy Vegetables (locally produced)	0.0011	0.01	0.081
Eggs (locally produced)	0.069	0.44	2.6
Cottage Cheese (locally produced)	0.0024	0.023	0.24
Inhalation	0.054	0.18	0.66
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.4	6.5	35
Diet 2	0.43	2.1	12
Diet 3	0.12	0.47	2.1

Excess Lifetime Risk [ ]			
Diet 1	1.3E-07	7.9E-06	2.3E-04
Diet 2	5.3E-08	2.5E-06	7.7E-05
Diet 3	1.4E-08	5.6E-07	1.5E-05
Diet 4	3.2E-07	1.7E-05	6.3E-04

Relative Risk [ ]			
Diet 1	1.00029	1.006	1.16
Diet 2	1.000087	1.0019	1.057
Diet 3	1.000021	1.00042	1.011
Diet 4	1.00046	1.016	1.45

Probability of Causation [%]			
Diet 1	0.029	0.600	13.99
Diet 2	0.009	0.191	5.41
Diet 3	0.002	0.042	1.10
Diet 4	0.046	1.570	30.97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.16	0.97	5.5
Commercial Milk (locally produced)	0.03	0.2	1.5
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.31	2.4	20
Beef (locally produced)	0.00053	0.008	0.16
Leafy Vegetables (locally produced)	0.00019	0.0021	0.019
Eggs (locally produced)	0.012	0.084	0.6
Cottage Cheese (locally produced)	0.00047	0.005	0.056
Inhalation	0.0087	0.03	0.11
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.2	1.1	6.3
Diet 2	0.071	0.36	2.2
Diet 3	0.05	0.23	1.4

Excess Lifetime Risk [ ]			
Diet 1	2.8E-07	4.1E-06	6.8E-05
Diet 2	8.3E-08	1.4E-06	1.8E-05
Diet 3	6.4E-08	8.9E-07	1.3E-05
Diet 4	6.0E-07	9.9E-06	1.4E-04

Relative Risk [ ]			
Diet 1	1.00017	1.0016	1.018
Diet 2	1.000063	1.0005	1.0066
Diet 3	1.00004	1.00035	1.004
Diet 4	1.00035	1.0034	1.055

Probability of Causation [%]			
Diet 1	0.017	0.156	1.80
Diet 2	0.006	0.050	0.65
Diet 3	0.004	0.035	0.40
Diet 4	0.035	0.336	5.19

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.19	1.1	6.6
Commercial Milk (locally produced)	0.042	0.24	1.8
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.44	3.2	24
Beef (locally produced)	0.00081	0.013	0.26
Leafy Vegetables (locally produced)	0.00019	0.0021	0.02
Eggs (locally produced)	0.012	0.089	0.68
Cottage Cheese (locally produced)	0.00044	0.0047	0.053
Inhalation	0.011	0.04	0.14
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.23	1.3	7.4
Diet 2	0.09	0.43	2.8
Diet 3	0.067	0.3	1.6

Excess Lifetime Risk [ ]			
Diet 1	2.8E-08	1.7E-06	5.3E-05
Diet 2	1.1E-08	5.3E-07	1.9E-05
Diet 3	9.1E-09	3.6E-07	1.3E-05
Diet 4	6.8E-08	3.6E-06	1.3E-04

Relative Risk [ ]			
Diet 1	1.000054	1.0012	1.038
Diet 2	1.000015	1.00043	1.012
Diet 3	1.000012	1.00027	1.0084
Diet 4	1.0001	1.0032	1.091

Probability of Causation [%]			
Diet 1	0.005	0.125	3.62
Diet 2	0.001	0.043	1.21
Diet 3	0.001	0.027	0.83
Diet 4	0.010	0.314	8.30

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0011	0.011	0.1
Inhalation	0.02	0.063	0.23
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.066	0.27	1.5

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	7.8E-08	1.0E-06	1.4E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00005	1.00041	1.0044
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.005	0.041	0.44
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0012	0.011	0.094
Inhalation	0.025	0.082	0.28
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.083	0.35	1.8

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.1E-08	4.2E-07	1.4E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.000014	1.00031	1.0096
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.001	0.031	0.95
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways  
Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways  
Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)  
Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.16	0.89	5.8
Commercial Milk (locally produced)	0.028	0.19	1.4
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.28	2.3	21
Beef (locally produced)	0.00045	0.0077	0.18
Leafy Vegetables (locally produced)	0.0002	0.002	0.018
Eggs (locally produced)	0.01	0.077	0.54
Cottage Cheese (locally produced)	0.0004	0.0046	0.055
Inhalation	0.0082	0.029	0.11
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.19	1	6.6
Diet 2	0.061	0.34	2.2
Diet 3	0.049	0.23	1.4

Excess Lifetime Risk [ ]			
Diet 1	2.6E-07	4.2E-06	6.7E-05
Diet 2	7.8E-08	1.3E-06	1.9E-05
Diet 3	6.2E-08	8.8E-07	1.3E-05
Diet 4	5.6E-07	9.0E-06	1.6E-04

Relative Risk [ ]			
Diet 1	1.00016	1.0015	1.017
Diet 2	1.000051	1.00047	1.0061
Diet 3	1.000039	1.00035	1.004
Diet 4	1.0003	1.0032	1.051

Probability of Causation [%]			
Diet 1	0.016	0.148	1.69
Diet 2	0.005	0.047	0.61
Diet 3	0.004	0.035	0.40
Diet 4	0.030	0.321	4.81

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.19	1.1	6.9
Commercial Milk (locally produced)	0.037	0.24	1.8
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.39	3	24
Beef (locally produced)	0.00074	0.012	0.28
Leafy Vegetables (locally produced)	0.00021	0.002	0.019
Eggs (locally produced)	0.011	0.083	0.59
Cottage Cheese (locally produced)	0.00044	0.0046	0.055
Inhalation	0.0098	0.037	0.13
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.23	1.2	8.2
Diet 2	0.074	0.41	2.7
Diet 3	0.064	0.3	1.6

Excess Lifetime Risk [ ]			
Diet 1	2.7E-08	1.4E-06	4.9E-05
Diet 2	9.8E-09	4.6E-07	1.7E-05
Diet 3	8.7E-09	3.5E-07	1.3E-05
Diet 4	6.4E-08	3.3E-06	1.2E-04

Relative Risk [ ]			
Diet 1	1.000051	1.0012	1.037
Diet 2	1.000015	1.00039	1.013
Diet 3	1.000011	1.00027	1.0085
Diet 4	1.000092	1.003	1.098

Probability of Causation [%]			
Diet 1	0.005	0.115	3.59
Diet 2	0.002	0.039	1.26
Diet 3	0.001	0.027	0.84
Diet 4	0.009	0.294	8.93

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0017	0.016	0.15
Inhalation	0.03	0.097	0.34
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.079	0.31	1.7

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	9.5E-08	1.2E-06	1.5E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.000059	1.00047	1.0048
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.006	0.047	0.48
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0016	0.016	0.15
Inhalation	0.037	0.12	0.43
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.099	0.4	1.9

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.2E-08	4.8E-07	1.4E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.000017	1.00036	1.01
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.002	0.036	1.01
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.85	4.6	25
Commercial Milk (locally produced)	0.16	0.94	6.4
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	1.5	11	81
Beef (locally produced)	0.0023	0.037	0.75
Leafy Vegetables (locally produced)	0.0009	0.0096	0.08
Eggs (locally produced)	0.061	0.39	2.4
Cottage Cheese (locally produced)	0.0023	0.022	0.22
Inhalation	0.043	0.14	0.5
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1	5.3	29
Diet 2	0.33	1.7	9.8
Diet 3	0.098	0.36	1.8

Excess Lifetime Risk [ ]			
Diet 1	1.3E-06	1.9E-05	2.9E-04
Diet 2	4.1E-07	6.2E-06	8.0E-05
Diet 3	1.2E-07	1.3E-06	1.6E-05
Diet 4	2.6E-06	4.6E-05	6.3E-04

Relative Risk [ ]			
Diet 1	1.00082	1.0073	1.079
Diet 2	1.00027	1.0023	1.027
Diet 3	1.000069	1.00054	1.0053
Diet 4	1.0017	1.016	1.25

Probability of Causation [%]			
Diet 1	0.082	0.727	7.29
Diet 2	0.027	0.228	2.61
Diet 3	0.007	0.054	0.53
Diet 4	0.166	1.545	19.75

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1	5.5	30
Commercial Milk (locally produced)	0.21	1.2	7.7
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	2.2	15	97
Beef (locally produced)	0.0036	0.058	1.2
Leafy Vegetables (locally produced)	0.00089	0.0096	0.083
Eggs (locally produced)	0.06	0.41	2.8
Cottage Cheese (locally produced)	0.0023	0.023	0.22
Inhalation	0.054	0.18	0.61
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.2	6.4	35
Diet 2	0.42	2	11
Diet 3	0.12	0.47	2.1

Excess Lifetime Risk [ ]			
Diet 1	1.3E-07	7.6E-06	2.1E-04
Diet 2	5.1E-08	2.4E-06	8.2E-05
Diet 3	1.4E-08	5.6E-07	1.6E-05
Diet 4	3.1E-07	1.7E-05	6.1E-04

Relative Risk [ ]			
Diet 1	1.00028	1.0057	1.16
Diet 2	1.000081	1.0019	1.056
Diet 3	1.000022	1.00042	1.011
Diet 4	1.00044	1.014	1.44

Probability of Causation [%]			
Diet 1	0.028	0.567	13.63
Diet 2	0.008	0.185	5.30
Diet 3	0.002	0.042	1.11
Diet 4	0.044	1.406	30.41

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.13	0.68	4
Commercial Milk (locally produced)	0.022	0.15	1
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.21	1.8	14
Beef (locally produced)	0.00034	0.006	0.13
Leafy Vegetables (locally produced)	0.00013	0.0015	0.014
Eggs (locally produced)	0.0089	0.059	0.43
Cottage Cheese (locally produced)	0.00033	0.0035	0.038
Inhalation	0.0067	0.022	0.085
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.15	0.79	4.7
Diet 2	0.051	0.26	1.6
Diet 3	0.047	0.23	1.4

Excess Lifetime Risk [ ]			
Diet 1	1.8E-07	3.0E-06	5.3E-05
Diet 2	6.2E-08	9.7E-07	1.5E-05
Diet 3	6.0E-08	8.5E-07	1.3E-05
Diet 4	4.0E-07	6.7E-06	1.2E-04

Relative Risk [ ]			
Diet 1	1.00011	1.0011	1.013
Diet 2	1.000037	1.00036	1.0049
Diet 3	1.000037	1.00034	1.004
Diet 4	1.00022	1.0025	1.04

Probability of Causation [%]			
Diet 1	0.011	0.115	1.30
Diet 2	0.004	0.036	0.49
Diet 3	0.004	0.034	0.40
Diet 4	0.022	0.254	3.87

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.15	0.82	4.8
Commercial Milk (locally produced)	0.028	0.18	1.3
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.29	2.3	17
Beef (locally produced)	0.00055	0.0093	0.2
Leafy Vegetables (locally produced)	0.00013	0.0015	0.014
Eggs (locally produced)	0.0092	0.063	0.44
Cottage Cheese (locally produced)	0.00032	0.0035	0.037
Inhalation	0.0082	0.029	0.11
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.17	0.95	5.6
Diet 2	0.06	0.31	2
Diet 3	0.058	0.29	1.6

Excess Lifetime Risk [ ]			
Diet 1	2.0E-08	1.2E-06	3.8E-05
Diet 2	7.6E-09	3.7E-07	1.3E-05
Diet 3	8.6E-09	3.4E-07	1.3E-05
Diet 4	4.7E-08	2.8E-06	9.5E-05

Relative Risk [ ]			
Diet 1	1.00004	1.00091	1.026
Diet 2	1.000012	1.00031	1.009
Diet 3	1.000011	1.00026	1.0083
Diet 4	1.000065	1.0023	1.071

Probability of Causation [%]			
Diet 1	0.004	0.091	2.50
Diet 2	0.001	0.031	0.89
Diet 3	0.001	0.026	0.82
Diet 4	0.006	0.229	6.59

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.82	4.2	23
Commercial Milk (locally produced)	0.15	0.86	5.9
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	1.3	10	69
Beef (locally produced)	0.002	0.034	0.69
Leafy Vegetables (locally produced)	0.00086	0.009	0.071
Eggs (locally produced)	0.055	0.34	2.1
Cottage Cheese (locally produced)	0.0021	0.02	0.21
Inhalation	0.041	0.13	0.45
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.98	4.8	26
Diet 2	0.3	1.5	8.6
Diet 3	0.096	0.35	1.8

Excess Lifetime Risk [ ]			
Diet 1	1.2E-06	1.8E-05	2.7E-04
Diet 2	3.7E-07	5.7E-06	7.0E-05
Diet 3	1.1E-07	1.3E-06	1.6E-05
Diet 4	2.4E-06	4.0E-05	6.2E-04

Relative Risk [ ]			
Diet 1	1.00068	1.0067	1.069
Diet 2	1.00023	1.0022	1.025
Diet 3	1.000065	1.00053	1.0051
Diet 4	1.0016	1.014	1.24

Probability of Causation [%]			
Diet 1	0.068	0.668	6.47
Diet 2	0.023	0.218	2.42
Diet 3	0.006	0.053	0.51
Diet 4	0.158	1.424	19.48

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.95	5.1	28
Commercial Milk (locally produced)	0.18	1.1	6.8
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	2	14	91
Beef (locally produced)	0.0032	0.054	1.1
Leafy Vegetables (locally produced)	0.00084	0.0088	0.078
Eggs (locally produced)	0.059	0.38	2.5
Cottage Cheese (locally produced)	0.002	0.021	0.22
Inhalation	0.051	0.17	0.55
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.1	5.9	33
Diet 2	0.39	1.8	10
Diet 3	0.12	0.45	2

Excess Lifetime Risk [ ]			
Diet 1	1.2E-07	6.8E-06	1.8E-04
Diet 2	4.7E-08	2.2E-06	8.1E-05
Diet 3	1.4E-08	5.5E-07	1.5E-05
Diet 4	2.7E-07	1.5E-05	6.1E-04

Relative Risk [ ]			
Diet 1	1.00024	1.0054	1.15
Diet 2	1.000073	1.0017	1.049
Diet 3	1.000021	1.00042	1.011
Diet 4	1.00038	1.013	1.42

Probability of Causation [%]			
Diet 1	0.024	0.533	13.00
Diet 2	0.007	0.165	4.71
Diet 3	0.002	0.042	1.09
Diet 4	0.038	1.285	29.39

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.33	1.7	10
Commercial Milk (locally produced)	0.059	0.36	2.5
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.56	4.2	31
Beef (locally produced)	0.00086	0.015	0.29
Leafy Vegetables (locally produced)	0.00034	0.0037	0.032
Eggs (locally produced)	0.023	0.14	0.92
Cottage Cheese (locally produced)	0.00084	0.0088	0.091
Inhalation	0.016	0.054	0.19
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.4	2	11
Diet 2	0.13	0.65	4
Diet 3	0.063	0.26	1.5

Excess Lifetime Risk [ ]			
Diet 1	4.6E-07	7.5E-06	1.2E-04
Diet 2	1.6E-07	2.4E-06	3.2E-05
Diet 3	7.8E-08	9.9E-07	1.3E-05
Diet 4	1.1E-06	1.7E-05	2.6E-04

Relative Risk [ ]			
Diet 1	1.0003	1.0028	1.03
Diet 2	1.0001	1.00089	1.011
Diet 3	1.000047	1.00039	1.0043
Diet 4	1.00062	1.006	1.095

Probability of Causation [%]			
Diet 1	0.030	0.279	2.94
Diet 2	0.010	0.089	1.05
Diet 3	0.005	0.039	0.42
Diet 4	0.062	0.595	8.54

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.38	2.1	12
Commercial Milk (locally produced)	0.074	0.45	3.1
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.83	5.8	40
Beef (locally produced)	0.0014	0.023	0.47
Leafy Vegetables (locally produced)	0.00034	0.0036	0.034
Eggs (locally produced)	0.024	0.16	1.1
Cottage Cheese (locally produced)	0.00084	0.0086	0.091
Inhalation	0.02	0.071	0.24
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.46	2.5	13
Diet 2	0.16	0.77	4.7
Diet 3	0.078	0.33	1.7

Excess Lifetime Risk [ ]			
Diet 1	5.0E-08	2.9E-06	8.3E-05
Diet 2	2.0E-08	9.1E-07	3.2E-05
Diet 3	1.0E-08	4.1E-07	1.4E-05
Diet 4	1.2E-07	6.3E-06	2.5E-04

Relative Risk [ ]			
Diet 1	1.000098	1.0023	1.063
Diet 2	1.00003	1.00072	1.022
Diet 3	1.000014	1.0003	1.0091
Diet 4	1.00016	1.0054	1.17

Probability of Causation [%]			
Diet 1	0.010	0.227	5.91
Diet 2	0.003	0.072	2.11
Diet 3	0.001	0.030	0.91
Diet 4	0.016	0.541	14.28

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.00098	0.0092	0.093
Inhalation	0.018	0.06	0.21
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.064	0.26	1.5

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	7.9E-08	1.0E-06	1.3E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.000048	1.0004	1.0043
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.005	0.040	0.43
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.00095	0.0096	0.094
Inhalation	0.022	0.076	0.26
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.08	0.34	1.7

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0E-08	4.2E-07	1.4E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.000014	1.00031	1.0095
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.001	0.031	0.94
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.41	2.1	12
Commercial Milk (locally produced)	0.073	0.43	3
Commercial Milk (regionally mixed)	0.037	0.21	1.3
Goat Milk (locally produced)	0.65	5	37
Beef (locally produced)	0.00098	0.017	0.38
Leafy Vegetables (locally produced)	0.00044	0.0044	0.04
Eggs (locally produced)	0.027	0.18	1.1
Cottage Cheese (locally produced)	0.001	0.01	0.11
Inhalation	0.022	0.072	0.24
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.51	2.4	13
Diet 2	0.16	0.76	4.4
Diet 3	0.068	0.28	1.5

Excess Lifetime Risk [ ]			
Diet 1	5.4E-07	8.8E-06	1.4E-04
Diet 2	2.0E-07	2.9E-06	4.6E-05
Diet 3	8.2E-08	1.1E-06	1.4E-05
Diet 4	1.3E-06	2.0E-05	3.1E-04

Relative Risk [ ]			
Diet 1	1.00037	1.0035	1.035
Diet 2	1.00012	1.0011	1.014
Diet 3	1.000051	1.00042	1.0045
Diet 4	1.00073	1.0073	1.12

Probability of Causation [%]			
Diet 1	0.037	0.349	3.37
Diet 2	0.012	0.109	1.35
Diet 3	0.005	0.042	0.44
Diet 4	0.072	0.728	10.32

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.49	2.5	14
Commercial Milk (locally produced)	0.091	0.53	3.8
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.94	6.8	47
Beef (locally produced)	0.0016	0.027	0.62
Leafy Vegetables (locally produced)	0.00047	0.0045	0.041
Eggs (locally produced)	0.027	0.19	1.2
Cottage Cheese (locally produced)	0.001	0.011	0.11
Inhalation	0.026	0.091	0.31
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.57	2.9	16
Diet 2	0.19	0.91	5.3
Diet 3	0.085	0.36	1.8

Excess Lifetime Risk [ ]			
Diet 1	6.4E-08	3.5E-06	1.2E-04
Diet 2	2.6E-08	1.2E-06	4.1E-05
Diet 3	1.1E-08	4.3E-07	1.4E-05
Diet 4	1.5E-07	7.8E-06	3.0E-04

Relative Risk [ ]			
Diet 1	1.00012	1.0027	1.075
Diet 2	1.000036	1.00087	1.023
Diet 3	1.000015	1.00033	1.0098
Diet 4	1.00018	1.0069	1.21

Probability of Causation [%]			
Diet 1	0.012	0.266	6.95
Diet 2	0.004	0.087	2.25
Diet 3	0.001	0.033	0.97
Diet 4	0.018	0.680	17.20

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.46	2.3	13
Commercial Milk (locally produced)	0.078	0.49	3.3
Commercial Milk (regionally mixed)	0.037	0.21	1.3
Goat Milk (locally produced)	0.79	6	44
Beef (locally produced)	0.0012	0.02	0.47
Leafy Vegetables (locally produced)	0.00042	0.0051	0.043
Eggs (locally produced)	0.03	0.2	1.3
Cottage Cheese (locally produced)	0.0011	0.012	0.11
Inhalation	0.024	0.08	0.28
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.56	2.7	15
Diet 2	0.18	0.86	4.7
Diet 3	0.073	0.29	1.6

Excess Lifetime Risk [ ]			
Diet 1	6.4E-07	1.0E-05	1.7E-04
Diet 2	2.2E-07	3.3E-06	4.1E-05
Diet 3	8.6E-08	1.1E-06	1.4E-05
Diet 4	1.4E-06	2.4E-05	3.5E-04

Relative Risk [ ]			
Diet 1	1.00039	1.0038	1.04
Diet 2	1.00014	1.0012	1.015
Diet 3	1.000054	1.00044	1.0045
Diet 4	1.00088	1.0083	1.13

Probability of Causation [%]			
Diet 1	0.039	0.379	3.83
Diet 2	0.014	0.124	1.52
Diet 3	0.005	0.044	0.45
Diet 4	0.088	0.823	11.35

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.54	2.8	16
Commercial Milk (locally produced)	0.1	0.6	3.8
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	1.1	8.1	55
Beef (locally produced)	0.0019	0.031	0.76
Leafy Vegetables (locally produced)	0.00046	0.005	0.046
Eggs (locally produced)	0.032	0.21	1.5
Cottage Cheese (locally produced)	0.0012	0.012	0.11
Inhalation	0.028	0.1	0.34
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.65	3.2	18
Diet 2	0.22	1	5.6
Diet 3	0.089	0.37	1.8

Excess Lifetime Risk [ ]			
Diet 1	7.2E-08	3.9E-06	1.3E-04
Diet 2	3.0E-08	1.2E-06	4.8E-05
Diet 3	1.1E-08	4.5E-07	1.4E-05
Diet 4	1.7E-07	8.2E-06	3.7E-04

Relative Risk [ ]			
Diet 1	1.00015	1.003	1.087
Diet 2	1.000044	1.00097	1.029
Diet 3	1.000015	1.00033	1.0099
Diet 4	1.00024	1.0075	1.23

Probability of Causation [%]			
Diet 1	0.015	0.296	8.02
Diet 2	0.004	0.097	2.79
Diet 3	0.002	0.033	0.98
Diet 4	0.024	0.745	18.82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.29	1.4	7.9
Commercial Milk (locally produced)	0.051	0.3	2
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.00066	0.012	0.23
Leafy Vegetables (locally produced)	0.00035	0.0031	0.025
Eggs (locally produced)	0.019	0.12	0.83
Cottage Cheese (locally produced)	0.00071	0.0073	0.07
Inhalation	0.015	0.05	0.18
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.34	1.7	8.7
Diet 2	0.12	0.51	2.8
Diet 3	0.061	0.26	1.5

Excess Lifetime Risk [ ]			
Diet 1	3.9E-07	6.0E-06	1.1E-04
Diet 2	1.5E-07	2.0E-06	3.1E-05
Diet 3	7.5E-08	9.7E-07	1.3E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.00028	1.0024	1.025
Diet 2	1.000088	1.00076	1.0091
Diet 3	1.000046	1.00039	1.0042
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.028	0.238	2.47
Diet 2	0.009	0.076	0.90
Diet 3	0.005	0.039	0.42
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.35	1.7	8.8
Commercial Milk (locally produced)	0.061	0.37	2.4
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0011	0.019	0.36
Leafy Vegetables (locally produced)	0.00034	0.003	0.024
Eggs (locally produced)	0.021	0.13	0.79
Cottage Cheese (locally produced)	0.0007	0.0072	0.074
Inhalation	0.019	0.063	0.23
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.41	2	9.9
Diet 2	0.14	0.62	3.4
Diet 3	0.073	0.33	1.7

Excess Lifetime Risk [ ]			
Diet 1	3.7E-08	2.4E-06	6.9E-05
Diet 2	1.6E-08	7.7E-07	2.3E-05
Diet 3	9.9E-09	4.1E-07	1.3E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.000092	1.0018	1.045
Diet 2	1.000027	1.00061	1.018
Diet 3	1.000014	1.00029	1.0093
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.009	0.180	4.28
Diet 2	0.003	0.061	1.73
Diet 3	0.001	0.029	0.92
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.34	1.9	10
Commercial Milk (locally produced)	0.062	0.38	2.5
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.59	4.6	33
Beef (locally produced)	0.00096	0.016	0.33
Leafy Vegetables (locally produced)	0.00037	0.0039	0.033
Eggs (locally produced)	0.023	0.15	0.98
Cottage Cheese (locally produced)	0.00095	0.0092	0.084
Inhalation	0.02	0.065	0.23
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.42	2.2	12
Diet 2	0.15	0.68	4
Diet 3	0.066	0.27	1.6

Excess Lifetime Risk [ ]			
Diet 1	4.7E-07	7.8E-06	1.2E-04
Diet 2	1.6E-07	2.6E-06	3.4E-05
Diet 3	8.1E-08	1.0E-06	1.4E-05
Diet 4	1.2E-06	1.7E-05	2.8E-04

Relative Risk [ ]			
Diet 1	1.00034	1.003	1.031
Diet 2	1.00011	1.00098	1.011
Diet 3	1.00005	1.00041	1.0043
Diet 4	1.0007	1.0065	1.092

Probability of Causation [%]			
Diet 1	0.034	0.300	3.01
Diet 2	0.011	0.097	1.06
Diet 3	0.005	0.041	0.43
Diet 4	0.070	0.648	8.41

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.4	2.2	12
Commercial Milk (locally produced)	0.083	0.47	3
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.85	6.3	41
Beef (locally produced)	0.0015	0.024	0.52
Leafy Vegetables (locally produced)	0.00041	0.0039	0.034
Eggs (locally produced)	0.025	0.17	1
Cottage Cheese (locally produced)	0.00096	0.0094	0.088
Inhalation	0.024	0.083	0.29
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.49	2.6	14
Diet 2	0.18	0.82	4.7
Diet 3	0.081	0.35	1.8

Excess Lifetime Risk [ ]			
Diet 1	5.5E-08	3.0E-06	9.3E-05
Diet 2	2.2E-08	1.0E-06	3.2E-05
Diet 3	1.1E-08	4.2E-07	1.4E-05
Diet 4	1.1E-07	6.9E-06	2.7E-04

Relative Risk [ ]			
Diet 1	1.0001	1.0024	1.065
Diet 2	1.000032	1.00074	1.023
Diet 3	1.000015	1.00032	1.0097
Diet 4	1.00017	1.0057	1.19

Probability of Causation [%]			
Diet 1	0.010	0.235	6.13
Diet 2	0.003	0.074	2.26
Diet 3	0.001	0.032	0.96
Diet 4	0.017	0.572	15.61

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.48	2.5	14
Commercial Milk (locally produced)	0.088	0.52	3.2
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.79	6.3	45
Beef (locally produced)	0.0012	0.021	0.43
Leafy Vegetables (locally produced)	0.00048	0.0054	0.043
Eggs (locally produced)	0.032	0.21	1.3
Cottage Cheese (locally produced)	0.0012	0.013	0.12
Inhalation	0.027	0.088	0.3
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.59	2.9	16
Diet 2	0.19	0.93	4.9
Diet 3	0.076	0.3	1.6

Excess Lifetime Risk [ ]			
Diet 1	6.6E-07	1.1E-05	1.7E-04
Diet 2	2.4E-07	3.5E-06	4.5E-05
Diet 3	9.1E-08	1.2E-06	1.4E-05
Diet 4	1.5E-06	2.5E-05	4.0E-04

Relative Risk [ ]			
Diet 1	1.00046	1.0041	1.042
Diet 2	1.00016	1.0014	1.015
Diet 3	1.000058	1.00045	1.0046
Diet 4	1.00094	1.0087	1.13

Probability of Causation [%]			
Diet 1	0.046	0.404	4.01
Diet 2	0.016	0.136	1.51
Diet 3	0.006	0.045	0.46
Diet 4	0.094	0.865	11.82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.57	3	15
Commercial Milk (locally produced)	0.11	0.64	3.9
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	1.1	8.4	58
Beef (locally produced)	0.002	0.032	0.71
Leafy Vegetables (locally produced)	0.00049	0.0054	0.045
Eggs (locally produced)	0.035	0.23	1.5
Cottage Cheese (locally produced)	0.0013	0.012	0.11
Inhalation	0.032	0.11	0.38
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.68	3.5	17
Diet 2	0.24	1.1	5.8
Diet 3	0.093	0.39	1.9

Excess Lifetime Risk [ ]			
Diet 1	7.7E-08	4.3E-06	1.2E-04
Diet 2	3.0E-08	1.3E-06	4.6E-05
Diet 3	1.2E-08	4.7E-07	1.4E-05
Diet 4	1.8E-07	9.0E-06	3.8E-04

Relative Risk [ ]			
Diet 1	1.00015	1.0033	1.088
Diet 2	1.000045	1.001	1.029
Diet 3	1.000016	1.00035	1.01
Diet 4	1.00027	1.008	1.24

Probability of Causation [%]			
Diet 1	0.015	0.326	8.08
Diet 2	0.005	0.101	2.80
Diet 3	0.002	0.035	0.99
Diet 4	0.027	0.791	19.25

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.27	1.4	7.7
Commercial Milk (locally produced)	0.045	0.29	2
Commercial Milk (regionally mixed)	0.037	0.21	1.3
Goat Milk (locally produced)	0.46	3.4	24
Beef (locally produced)	0.00072	0.012	0.24
Leafy Vegetables (locally produced)	0.00028	0.0029	0.025
Eggs (locally produced)	0.018	0.12	0.73
Cottage Cheese (locally produced)	0.00067	0.007	0.07
Inhalation	0.016	0.052	0.18
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.34	1.6	8.8
Diet 2	0.11	0.52	2.9
Diet 3	0.062	0.26	1.5

Excess Lifetime Risk [ ]			
Diet 1	3.7E-07	6.1E-06	9.7E-05
Diet 2	1.3E-07	2.0E-06	2.8E-05
Diet 3	7.4E-08	9.7E-07	1.3E-05
Diet 4	8.7E-07	1.4E-05	2.1E-04

Relative Risk [ ]			
Diet 1	1.00025	1.0022	1.023
Diet 2	1.000084	1.00073	1.0082
Diet 3	1.000045	1.00038	1.0043
Diet 4	1.00049	1.0048	1.077

Probability of Causation [%]			
Diet 1	0.025	0.222	2.25
Diet 2	0.008	0.073	0.81
Diet 3	0.005	0.038	0.42
Diet 4	0.049	0.479	7.15

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.33	1.7	9
Commercial Milk (locally produced)	0.059	0.37	2.3
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.66	4.7	32
Beef (locally produced)	0.0012	0.018	0.38
Leafy Vegetables (locally produced)	0.00029	0.0029	0.027
Eggs (locally produced)	0.019	0.13	0.81
Cottage Cheese (locally produced)	0.00067	0.0069	0.072
Inhalation	0.019	0.067	0.23
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.39	2	11
Diet 2	0.13	0.64	3.5
Diet 3	0.075	0.33	1.7

Excess Lifetime Risk [ ]			
Diet 1	4.2E-08	2.3E-06	6.8E-05
Diet 2	1.8E-08	7.3E-07	2.5E-05
Diet 3	1.0E-08	4.0E-07	1.3E-05
Diet 4	1.1E-07	5.1E-06	2.1E-04

Relative Risk [ ]			
Diet 1	1.000078	1.0019	1.049
Diet 2	1.000025	1.0006	1.017
Diet 3	1.000014	1.0003	1.0092
Diet 4	1.00013	1.0046	1.13

Probability of Causation [%]			
Diet 1	0.008	0.187	4.68
Diet 2	0.003	0.060	1.63
Diet 3	0.001	0.030	0.91
Diet 4	0.013	0.458	11.37

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.17	0.82	4.5
Commercial Milk (locally produced)	0.03	0.17	1.2
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.25	2	14
Beef (locally produced)	0.00039	0.0071	0.13
Leafy Vegetables (locally produced)	0.0002	0.0018	0.015
Eggs (locally produced)	0.011	0.068	0.46
Cottage Cheese (locally produced)	0.00042	0.004	0.039
Inhalation	0.0085	0.028	0.1
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.2	0.96	5
Diet 2	0.066	0.29	1.7
Diet 3	0.051	0.23	1.4

Excess Lifetime Risk [ ]			
Diet 1	2.3E-07	3.5E-06	5.9E-05
Diet 2	8.4E-08	1.2E-06	1.7E-05
Diet 3	6.4E-08	8.9E-07	1.3E-05
Diet 4	5.4E-07	7.9E-06	1.3E-04

Relative Risk [ ]			
Diet 1	1.00015	1.0013	1.014
Diet 2	1.00005	1.00044	1.0052
Diet 3	1.000038	1.00035	1.004
Diet 4	1.00029	1.0028	1.04

Probability of Causation [%]			
Diet 1	0.015	0.135	1.42
Diet 2	0.005	0.044	0.52
Diet 3	0.004	0.035	0.40
Diet 4	0.029	0.283	3.85

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.2	0.98	5.1
Commercial Milk (locally produced)	0.035	0.21	1.4
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.38	2.8	18
Beef (locally produced)	0.00063	0.011	0.21
Leafy Vegetables (locally produced)	0.00019	0.0017	0.014
Eggs (locally produced)	0.012	0.075	0.46
Cottage Cheese (locally produced)	0.00041	0.0041	0.042
Inhalation	0.011	0.035	0.13
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.24	1.1	5.9
Diet 2	0.08	0.36	2
Diet 3	0.061	0.29	1.6

Excess Lifetime Risk [ ]			
Diet 1	2.1E-08	1.4E-06	4.0E-05
Diet 2	9.0E-09	4.4E-07	1.4E-05
Diet 3	8.6E-09	3.6E-07	1.3E-05
Diet 4	5.6E-08	3.1E-06	1.1E-04

Relative Risk [ ]			
Diet 1	1.000051	1.001	1.026
Diet 2	1.000015	1.00035	1.01
Diet 3	1.000012	1.00027	1.0085
Diet 4	1.000077	1.0027	1.07

Probability of Causation [%]			
Diet 1	0.005	0.104	2.56
Diet 2	0.002	0.035	0.99
Diet 3	0.001	0.027	0.85
Diet 4	0.008	0.271	6.54

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.39	1.9	11
Commercial Milk (locally produced)	0.072	0.4	2.8
Commercial Milk (regionally mixed)	0.037	0.21	1.3
Goat Milk (locally produced)	0.62	4.7	35
Beef (locally produced)	0.00092	0.017	0.36
Leafy Vegetables (locally produced)	0.00042	0.0042	0.035
Eggs (locally produced)	0.026	0.17	1
Cottage Cheese (locally produced)	0.001	0.0097	0.098
Inhalation	0.022	0.072	0.24
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.47	2.3	13
Diet 2	0.15	0.72	4
Diet 3	0.068	0.28	1.5

Excess Lifetime Risk [ ]			
Diet 1	5.1E-07	8.3E-06	1.4E-04
Diet 2	1.8E-07	2.8E-06	4.1E-05
Diet 3	8.2E-08	1.1E-06	1.4E-05
Diet 4	1.2E-06	1.9E-05	2.8E-04

Relative Risk [ ]			
Diet 1	1.00036	1.0033	1.032
Diet 2	1.00012	1.001	1.012
Diet 3	1.000052	1.00042	1.0044
Diet 4	1.0007	1.0069	1.11

Probability of Causation [%]			
Diet 1	0.036	0.331	3.12
Diet 2	0.012	0.104	1.17
Diet 3	0.005	0.042	0.44
Diet 4	0.070	0.686	9.72

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.46	2.4	13
Commercial Milk (locally produced)	0.09	0.51	3.4
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.9	6.4	42
Beef (locally produced)	0.0015	0.026	0.6
Leafy Vegetables (locally produced)	0.00044	0.0042	0.036
Eggs (locally produced)	0.027	0.18	1.1
Cottage Cheese (locally produced)	0.001	0.0098	0.1
Inhalation	0.026	0.092	0.31
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.53	2.7	14
Diet 2	0.18	0.87	4.9
Diet 3	0.086	0.36	1.8

Excess Lifetime Risk [ ]			
Diet 1	5.8E-08	3.3E-06	9.9E-05
Diet 2	2.4E-08	1.1E-06	3.6E-05
Diet 3	1.1E-08	4.3E-07	1.4E-05
Diet 4	1.4E-07	7.5E-06	2.7E-04

Relative Risk [ ]			
Diet 1	1.00012	1.0025	1.069
Diet 2	1.000036	1.00081	1.021
Diet 3	1.000014	1.00033	1.0098
Diet 4	1.00018	1.0062	1.19

Probability of Causation [%]			
Diet 1	0.012	0.249	6.41
Diet 2	0.004	0.081	2.10
Diet 3	0.001	0.033	0.97
Diet 4	0.018	0.616	15.92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.083	0.46	2.8
Commercial Milk (locally produced)	0.015	0.099	0.66
Commercial Milk (regionally mixed)	0.037	0.21	1.3
Goat Milk (locally produced)	0.13	1.1	8
Beef (locally produced)	0.00023	0.0039	0.079
Leafy Vegetables (locally produced)	0.000094	0.001	0.0081
Eggs (locally produced)	0.0054	0.04	0.25
Cottage Cheese (locally produced)	0.00023	0.0023	0.023
Inhalation	0.0049	0.016	0.061
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.1	0.54	3.1
Diet 2	0.034	0.17	0.98
Diet 3	0.045	0.22	1.4

Excess Lifetime Risk [ ]			
Diet 1	1.2E-07	2.0E-06	3.2E-05
Diet 2	4.4E-08	6.5E-07	9.4E-06
Diet 3	5.6E-08	8.3E-07	1.3E-05
Diet 4	2.5E-07	4.4E-06	7.3E-05

Relative Risk [ ]			
Diet 1	1.000072	1.00077	1.0081
Diet 2	1.000026	1.00025	1.0029
Diet 3	1.000035	1.00033	1.0039
Diet 4	1.00015	1.0016	1.024

Probability of Causation [%]			
Diet 1	0.007	0.077	0.81
Diet 2	0.003	0.025	0.29
Diet 3	0.003	0.033	0.39
Diet 4	0.015	0.159	2.32

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.098	0.55	3.3
Commercial Milk (locally produced)	0.019	0.12	0.8
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.18	1.5	11
Beef (locally produced)	0.00036	0.0061	0.13
Leafy Vegetables (locally produced)	0.000094	0.001	0.0088
Eggs (locally produced)	0.0057	0.043	0.28
Cottage Cheese (locally produced)	0.00023	0.0024	0.026
Inhalation	0.0059	0.021	0.075
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.12	0.64	3.8
Diet 2	0.042	0.21	1.2
Diet 3	0.055	0.28	1.6

Excess Lifetime Risk [ ]			
Diet 1	1.2E-08	7.7E-07	2.4E-05
Diet 2	5.1E-09	2.5E-07	8.6E-06
Diet 3	8.0E-09	3.2E-07	1.3E-05
Diet 4	3.1E-08	1.7E-06	7.0E-05

Relative Risk [ ]			
Diet 1	1.000028	1.0006	1.017
Diet 2	1.0000077	1.00019	1.0055
Diet 3	1.00001	1.00025	1.0079
Diet 4	1.000045	1.0015	1.044

Probability of Causation [%]			
Diet 1	0.003	0.060	1.72
Diet 2	0.001	0.019	0.54
Diet 3	0.001	0.025	0.78
Diet 4	0.005	0.154	4.16

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.32	1.6	9.1
Commercial Milk (locally produced)	0.06	0.34	2.3
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.55	4	29
Beef (locally produced)	0.00078	0.014	0.3
Leafy Vegetables (locally produced)	0.00034	0.0036	0.029
Eggs (locally produced)	0.022	0.14	0.85
Cottage Cheese (locally produced)	0.00084	0.008	0.082
Inhalation	0.018	0.059	0.2
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.39	1.9	10
Diet 2	0.13	0.6	3.3
Diet 3	0.064	0.26	1.5

Excess Lifetime Risk [ ]			
Diet 1	4.5E-07	7.1E-06	1.1E-04
Diet 2	1.6E-07	2.3E-06	3.4E-05
Diet 3	7.8E-08	1.0E-06	1.3E-05
Diet 4	9.9E-07	1.6E-05	2.4E-04

Relative Risk [ ]			
Diet 1	1.00029	1.0027	1.027
Diet 2	1.000099	1.00087	1.0098
Diet 3	1.000048	1.0004	1.0043
Diet 4	1.0006	1.0057	1.087

Probability of Causation [%]			
Diet 1	0.029	0.274	2.61
Diet 2	0.010	0.087	0.97
Diet 3	0.005	0.040	0.43
Diet 4	0.060	0.569	8.02

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.39	2	11
Commercial Milk (locally produced)	0.075	0.42	2.8
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.78	5.4	36
Beef (locally produced)	0.0013	0.022	0.49
Leafy Vegetables (locally produced)	0.00036	0.0035	0.03
Eggs (locally produced)	0.023	0.15	0.93
Cottage Cheese (locally produced)	0.00085	0.0082	0.08
Inhalation	0.022	0.077	0.25
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.45	2.3	12
Diet 2	0.16	0.73	4
Diet 3	0.08	0.34	1.7

Excess Lifetime Risk [ ]			
Diet 1	4.9E-08	2.7E-06	8.3E-05
Diet 2	2.0E-08	9.0E-07	3.1E-05
Diet 3	1.1E-08	4.2E-07	1.3E-05
Diet 4	1.2E-07	6.2E-06	2.2E-04

Relative Risk [ ]			
Diet 1	1.000096	1.0021	1.056
Diet 2	1.00003	1.00068	1.018
Diet 3	1.000014	1.00031	1.0095
Diet 4	1.00015	1.0052	1.16

Probability of Causation [%]			
Diet 1	0.010	0.208	5.29
Diet 2	0.003	0.068	1.81
Diet 3	0.001	0.031	0.95
Diet 4	0.015	0.519	13.74

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.15	0.79	4.3
Commercial Milk (locally produced)	0.029	0.17	1.1
Commercial Milk (regionally mixed)	0.037	0.21	1.3
Goat Milk (locally produced)	0.23	1.9	14
Beef (locally produced)	0.00036	0.0066	0.12
Leafy Vegetables (locally produced)	0.00017	0.0017	0.014
Eggs (locally produced)	0.01	0.067	0.43
Cottage Cheese (locally produced)	0.00039	0.004	0.038
Inhalation	0.0083	0.028	0.099
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.18	0.93	4.7
Diet 2	0.062	0.29	1.5
Diet 3	0.05	0.23	1.4

Excess Lifetime Risk [ ]			
Diet 1	2.0E-07	3.4E-06	5.4E-05
Diet 2	7.6E-08	1.1E-06	1.6E-05
Diet 3	6.3E-08	8.8E-07	1.3E-05
Diet 4	4.6E-07	7.7E-06	1.3E-04

Relative Risk [ ]			
Diet 1	1.00016	1.0013	1.013
Diet 2	1.000049	1.00043	1.005
Diet 3	1.000039	1.00035	1.004
Diet 4	1.00027	1.0028	1.042

Probability of Causation [%]			
Diet 1	0.016	0.129	1.31
Diet 2	0.005	0.043	0.50
Diet 3	0.004	0.035	0.40
Diet 4	0.027	0.276	3.99

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.18	0.95	4.8
Commercial Milk (locally produced)	0.034	0.2	1.3
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.33	2.6	18
Beef (locally produced)	0.00061	0.01	0.2
Leafy Vegetables (locally produced)	0.00017	0.0017	0.014
Eggs (locally produced)	0.011	0.073	0.44
Cottage Cheese (locally produced)	0.0004	0.0039	0.039
Inhalation	0.01	0.036	0.13
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.21	1.1	5.5
Diet 2	0.073	0.35	1.9
Diet 3	0.061	0.3	1.6

Excess Lifetime Risk [ ]			
Diet 1	2.3E-08	1.3E-06	3.6E-05
Diet 2	9.1E-09	4.3E-07	1.3E-05
Diet 3	8.8E-09	3.6E-07	1.3E-05
Diet 4	5.9E-08	2.9E-06	1.1E-04

Relative Risk [ ]			
Diet 1	1.000048	1.001	1.026
Diet 2	1.000015	1.00033	1.0094
Diet 3	1.000012	1.00027	1.0085
Diet 4	1.000074	1.0026	1.068

Probability of Causation [%]			
Diet 1	0.005	0.102	2.56
Diet 2	0.001	0.033	0.93
Diet 3	0.001	0.027	0.84
Diet 4	0.007	0.259	6.33

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.24	1.3	7.3
Commercial Milk (locally produced)	0.045	0.26	1.8
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.41	3.1	22
Beef (locally produced)	0.0006	0.011	0.23
Leafy Vegetables (locally produced)	0.00026	0.0028	0.022
Eggs (locally produced)	0.017	0.11	0.66
Cottage Cheese (locally produced)	0.00066	0.0062	0.059
Inhalation	0.014	0.046	0.16
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.3	1.5	8.3
Diet 2	0.093	0.47	2.5
Diet 3	0.058	0.25	1.5

Excess Lifetime Risk [ ]			
Diet 1	3.4E-07	5.6E-06	8.9E-05
Diet 2	1.2E-07	1.8E-06	2.4E-05
Diet 3	7.0E-08	9.6E-07	1.3E-05
Diet 4	7.2E-07	1.2E-05	1.8E-04

Relative Risk [ ]			
Diet 1	1.00021	1.0021	1.021
Diet 2	1.000072	1.00068	1.0074
Diet 3	1.000043	1.00038	1.0042
Diet 4	1.00048	1.0044	1.07

Probability of Causation [%]			
Diet 1	0.021	0.214	2.09
Diet 2	0.007	0.068	0.74
Diet 3	0.004	0.038	0.41
Diet 4	0.048	0.442	6.56

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	1.5	8.6
Commercial Milk (locally produced)	0.056	0.33	2.1
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.56	4.2	27
Beef (locally produced)	0.001	0.016	0.37
Leafy Vegetables (locally produced)	0.00027	0.0027	0.023
Eggs (locally produced)	0.017	0.12	0.74
Cottage Cheese (locally produced)	0.00065	0.0064	0.064
Inhalation	0.017	0.058	0.2
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.33	1.8	9.8
Diet 2	0.12	0.57	3.1
Diet 3	0.072	0.32	1.7

Excess Lifetime Risk [ ]			
Diet 1	3.5E-08	2.2E-06	6.1E-05
Diet 2	1.5E-08	7.1E-07	2.4E-05
Diet 3	9.5E-09	3.9E-07	1.3E-05
Diet 4	8.7E-08	4.9E-06	1.8E-04

Relative Risk [ ]			
Diet 1	1.00008	1.0016	1.045
Diet 2	1.000023	1.00051	1.015
Diet 3	1.000013	1.00029	1.0091
Diet 4	1.00012	1.004	1.12

Probability of Causation [%]			
Diet 1	0.008	0.162	4.34
Diet 2	0.002	0.051	1.49
Diet 3	0.001	0.029	0.91
Diet 4	0.012	0.395	10.86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.13	0.71	4.1
Commercial Milk (locally produced)	0.024	0.15	1
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.21	1.7	15
Beef (locally produced)	0.00035	0.006	0.14
Leafy Vegetables (locally produced)	0.00014	0.0016	0.013
Eggs (locally produced)	0.0087	0.064	0.42
Cottage Cheese (locally produced)	0.00031	0.0036	0.035
Inhalation	0.0088	0.031	0.12
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.17	0.84	4.6
Diet 2	0.053	0.28	1.4
Diet 3	0.05	0.24	1.4

Excess Lifetime Risk [ ]			
Diet 1	2.1E-07	3.2E-06	5.4E-05
Diet 2	7.6E-08	1.1E-06	1.3E-05
Diet 3	6.4E-08	8.9E-07	1.3E-05
Diet 4	4.1E-07	6.9E-06	1.2E-04

Relative Risk [ ]			
Diet 1	1.00013	1.0012	1.012
Diet 2	1.000048	1.0004	1.0045
Diet 3	1.00004	1.00035	1.004
Diet 4	1.00026	1.0026	1.038

Probability of Causation [%]			
Diet 1	0.013	0.120	1.19
Diet 2	0.005	0.040	0.45
Diet 3	0.004	0.035	0.40
Diet 4	0.026	0.259	3.65

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.16	0.85	4.6
Commercial Milk (locally produced)	0.03	0.19	1.1
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.31	2.4	18
Beef (locally produced)	0.0006	0.0095	0.21
Leafy Vegetables (locally produced)	0.00014	0.0016	0.013
Eggs (locally produced)	0.0099	0.065	0.47
Cottage Cheese (locally produced)	0.00034	0.0035	0.035
Inhalation	0.01	0.04	0.13
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.19	0.99	5.2
Diet 2	0.064	0.33	1.6
Diet 3	0.065	0.3	1.6

Excess Lifetime Risk [ ]			
Diet 1	2.3E-08	1.3E-06	3.9E-05
Diet 2	9.0E-09	3.9E-07	1.4E-05
Diet 3	9.0E-09	3.6E-07	1.3E-05
Diet 4	5.5E-08	2.7E-06	1.2E-04

Relative Risk [ ]			
Diet 1	1.000043	1.00094	1.026
Diet 2	1.000013	1.00031	1.0086
Diet 3	1.000011	1.00027	1.0085
Diet 4	1.000081	1.0024	1.07

Probability of Causation [%]			
Diet 1	0.004	0.094	2.52
Diet 2	0.001	0.031	0.85
Diet 3	0.001	0.027	0.84
Diet 4	0.008	0.235	6.57

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.033	0.2	1.2
Commercial Milk (locally produced)	0.0059	0.042	0.3
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.061	0.51	3.8
Beef (locally produced)	0.00011	0.0017	0.039
Leafy Vegetables (locally produced)	0.000039	0.00041	0.004
Eggs (locally produced)	0.0021	0.017	0.11
Cottage Cheese (locally produced)	0.00008	0.001	0.01
Inhalation	0.002	0.0073	0.03
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.042	0.23	1.3
Diet 2	0.014	0.075	0.48
Diet 3	0.04	0.21	1.4

Excess Lifetime Risk [ ]			
Diet 1	4.8E-08	8.4E-07	1.7E-05
Diet 2	1.7E-08	2.8E-07	4.1E-06
Diet 3	5.3E-08	7.9E-07	1.3E-05
Diet 4	1.0E-07	1.8E-06	3.1E-05

Relative Risk [ ]			
Diet 1	1.000034	1.00031	1.0041
Diet 2	1.000012	1.00011	1.0015
Diet 3	1.000032	1.00032	1.0038
Diet 4	1.000068	1.00069	1.011

Probability of Causation [%]			
Diet 1	0.003	0.032	0.41
Diet 2	0.001	0.011	0.15
Diet 3	0.003	0.032	0.38
Diet 4	0.007	0.069	1.09

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**  
**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.04	0.23	1.3
Commercial Milk (locally produced)	0.008	0.053	0.37
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.088	0.69	4.8
Beef (locally produced)	0.00018	0.0025	0.059
Leafy Vegetables (locally produced)	0.000038	0.00043	0.004
Eggs (locally produced)	0.0022	0.018	0.12
Cottage Cheese (locally produced)	0.000084	0.001	0.01
Inhalation	0.0025	0.0095	0.037
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.049	0.27	1.5
Diet 2	0.016	0.088	0.55
Diet 3	0.049	0.26	1.6

Excess Lifetime Risk [ ]			
Diet 1	5.8E-09	3.3E-07	1.1E-05
Diet 2	2.2E-09	1.1E-07	3.5E-06
Diet 3	7.6E-09	3.0E-07	1.3E-05
Diet 4	1.4E-08	7.3E-07	2.9E-05

Relative Risk [ ]			
Diet 1	1.0000099	1.00026	1.0065
Diet 2	1.0000029	1.000082	1.0024
Diet 3	1.0000099	1.00024	1.0074
Diet 4	1.000018	1.00064	1.019

Probability of Causation [%]			
Diet 1	0.001	0.026	0.65
Diet 2	--	0.008	0.24
Diet 3	0.001	0.024	0.73
Diet 4	0.002	0.064	1.83

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.16	0.84	4.6
Commercial Milk (locally produced)	0.028	0.17	1.2
Commercial Milk (regionally mixed)	0.037	0.21	1.3
Goat Milk (locally produced)	0.28	2	15
Beef (locally produced)	0.00043	0.0069	0.16
Leafy Vegetables (locally produced)	0.00017	0.0018	0.015
Eggs (locally produced)	0.011	0.069	0.45
Cottage Cheese (locally produced)	0.00041	0.0043	0.039
Inhalation	0.0095	0.032	0.11
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.19	0.98	5.2
Diet 2	0.065	0.31	1.7
Diet 3	0.052	0.24	1.4

Excess Lifetime Risk [ ]			
Diet 1	2.2E-07	3.6E-06	5.8E-05
Diet 2	7.6E-08	1.2E-06	1.6E-05
Diet 3	6.4E-08	8.8E-07	1.3E-05
Diet 4	5.1E-07	8.3E-06	1.2E-04

Relative Risk [ ]			
Diet 1	1.00016	1.0013	1.014
Diet 2	1.000051	1.00044	1.0048
Diet 3	1.00004	1.00035	1.004
Diet 4	1.0003	1.0029	1.042

Probability of Causation [%]			
Diet 1	0.016	0.135	1.34
Diet 2	0.005	0.044	0.47
Diet 3	0.004	0.035	0.40
Diet 4	0.030	0.287	3.99

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.19	1	5.4
Commercial Milk (locally produced)	0.038	0.22	1.4
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.39	2.8	19
Beef (locally produced)	0.00069	0.011	0.24
Leafy Vegetables (locally produced)	0.00017	0.0017	0.016
Eggs (locally produced)	0.011	0.075	0.47
Cottage Cheese (locally produced)	0.00044	0.0041	0.04
Inhalation	0.011	0.042	0.14
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.22	1.2	6.2
Diet 2	0.082	0.37	2
Diet 3	0.064	0.3	1.6

Excess Lifetime Risk [ ]			
Diet 1	2.6E-08	1.3E-06	4.2E-05
Diet 2	1.1E-08	4.3E-07	1.6E-05
Diet 3	9.0E-09	3.5E-07	1.3E-05
Diet 4	6.3E-08	2.9E-06	1.2E-04

Relative Risk [ ]			
Diet 1	1.000048	1.0011	1.03
Diet 2	1.000016	1.00035	1.01
Diet 3	1.000012	1.00027	1.0086
Diet 4	1.000071	1.0027	1.079

Probability of Causation [%]			
Diet 1	0.005	0.106	2.91
Diet 2	0.002	0.035	1.01
Diet 3	0.001	0.027	0.85
Diet 4	0.007	0.269	7.27

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.14	0.77	4
Commercial Milk (locally produced)	0.026	0.16	1.1
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.23	1.9	14
Beef (locally produced)	0.00039	0.0064	0.13
Leafy Vegetables (locally produced)	0.00016	0.0016	0.014
Eggs (locally produced)	0.0094	0.064	0.42
Cottage Cheese (locally produced)	0.00036	0.0038	0.036
Inhalation	0.0093	0.032	0.12
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.17	0.9	4.6
Diet 2	0.06	0.29	1.6
Diet 3	0.052	0.24	1.4

Excess Lifetime Risk [ ]			
Diet 1	2.0E-07	3.3E-06	5.3E-05
Diet 2	7.6E-08	1.1E-06	1.6E-05
Diet 3	6.5E-08	9.0E-07	1.3E-05
Diet 4	4.3E-07	7.1E-06	1.3E-04

Relative Risk [ ]			
Diet 1	1.00015	1.0012	1.013
Diet 2	1.00005	1.00041	1.0047
Diet 3	1.000041	1.00035	1.004
Diet 4	1.00027	1.0027	1.038

Probability of Causation [%]			
Diet 1	0.015	0.124	1.27
Diet 2	0.005	0.041	0.46
Diet 3	0.004	0.035	0.40
Diet 4	0.027	0.266	3.65

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.16	0.9	4.6
Commercial Milk (locally produced)	0.032	0.2	1.2
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.33	2.6	18
Beef (locally produced)	0.00062	0.01	0.2
Leafy Vegetables (locally produced)	0.00016	0.0016	0.014
Eggs (locally produced)	0.01	0.07	0.44
Cottage Cheese (locally produced)	0.00036	0.0038	0.037
Inhalation	0.012	0.041	0.15
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.2	1.1	5.3
Diet 2	0.073	0.35	1.9
Diet 3	0.064	0.3	1.6

Excess Lifetime Risk [ ]			
Diet 1	2.3E-08	1.3E-06	3.7E-05
Diet 2	9.3E-09	4.2E-07	1.3E-05
Diet 3	9.0E-09	3.7E-07	1.3E-05
Diet 4	5.4E-08	2.8E-06	1.1E-04

Relative Risk [ ]			
Diet 1	1.000042	1.001	1.025
Diet 2	1.000014	1.00032	1.0094
Diet 3	1.000012	1.00027	1.0087
Diet 4	1.00007	1.0025	1.066

Probability of Causation [%]			
Diet 1	0.004	0.099	2.45
Diet 2	0.001	0.032	0.93
Diet 3	0.001	0.027	0.86
Diet 4	0.007	0.247	6.15

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.17	0.88	4.8
Commercial Milk (locally produced)	0.029	0.18	1.2
Commercial Milk (regionally mixed)	0.037	0.21	1.3
Goat Milk (locally produced)	0.27	2.1	16
Beef (locally produced)	0.00045	0.0073	0.15
Leafy Vegetables (locally produced)	0.00017	0.0018	0.015
Eggs (locally produced)	0.011	0.073	0.45
Cottage Cheese (locally produced)	0.00042	0.0043	0.04
Inhalation	0.011	0.037	0.14
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.2	1	5.5
Diet 2	0.068	0.33	1.8
Diet 3	0.053	0.24	1.5

Excess Lifetime Risk [ ]			
Diet 1	2.5E-07	3.8E-06	6.1E-05
Diet 2	8.5E-08	1.3E-06	1.7E-05
Diet 3	6.7E-08	9.1E-07	1.3E-05
Diet 4	5.2E-07	8.2E-06	1.4E-04

Relative Risk [ ]			
Diet 1	1.00017	1.0014	1.014
Diet 2	1.000056	1.00046	1.0049
Diet 3	1.000042	1.00036	1.0041
Diet 4	1.00031	1.0031	1.044

Probability of Causation [%]			
Diet 1	0.017	0.139	1.34
Diet 2	0.006	0.046	0.49
Diet 3	0.004	0.036	0.41
Diet 4	0.031	0.312	4.25

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.2	1	5.5
Commercial Milk (locally produced)	0.038	0.22	1.4
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.4	2.9	20
Beef (locally produced)	0.0007	0.011	0.23
Leafy Vegetables (locally produced)	0.00018	0.0018	0.017
Eggs (locally produced)	0.011	0.079	0.5
Cottage Cheese (locally produced)	0.0004	0.0044	0.042
Inhalation	0.013	0.048	0.17
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.24	1.2	6.4
Diet 2	0.086	0.4	2.1
Diet 3	0.066	0.31	1.6

Excess Lifetime Risk [ ]			
Diet 1	2.7E-08	1.5E-06	4.3E-05
Diet 2	1.1E-08	4.7E-07	1.5E-05
Diet 3	9.1E-09	3.7E-07	1.3E-05
Diet 4	6.3E-08	3.2E-06	1.3E-04

Relative Risk [ ]			
Diet 1	1.000047	1.0012	1.033
Diet 2	1.000017	1.00037	1.011
Diet 3	1.000012	1.00028	1.0088
Diet 4	1.000086	1.0028	1.08

Probability of Causation [%]			
Diet 1	0.005	0.115	3.17
Diet 2	0.002	0.037	1.09
Diet 3	0.001	0.028	0.88
Diet 4	0.009	0.277	7.40

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.089	0.48	2.7
Commercial Milk (locally produced)	0.016	0.098	0.67
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.14	1.1	9.4
Beef (locally produced)	0.00024	0.004	0.085
Leafy Vegetables (locally produced)	0.0001	0.00099	0.0089
Eggs (locally produced)	0.0056	0.039	0.27
Cottage Cheese (locally produced)	0.00024	0.0024	0.027
Inhalation	0.0063	0.022	0.081
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.11	0.55	3.1
Diet 2	0.038	0.18	1.1
Diet 3	0.049	0.23	1.4

Excess Lifetime Risk [ ]			
Diet 1	1.2E-07	2.0E-06	3.5E-05
Diet 2	5.1E-08	7.0E-07	9.9E-06
Diet 3	5.9E-08	8.5E-07	1.3E-05
Diet 4	2.7E-07	4.5E-06	8.5E-05

Relative Risk [ ]			
Diet 1	1.000084	1.00075	1.0085
Diet 2	1.000031	1.00026	1.0032
Diet 3	1.000037	1.00034	1.0039
Diet 4	1.00016	1.0016	1.029

Probability of Causation [%]			
Diet 1	0.008	0.075	0.84
Diet 2	0.003	0.026	0.32
Diet 3	0.004	0.034	0.39
Diet 4	0.016	0.158	2.82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.11	0.57	3.3
Commercial Milk (locally produced)	0.02	0.12	0.81
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.2	1.6	11
Beef (locally produced)	0.00039	0.0064	0.14
Leafy Vegetables (locally produced)	0.0001	0.00099	0.0095
Eggs (locally produced)	0.0063	0.042	0.28
Cottage Cheese (locally produced)	0.00021	0.0023	0.028
Inhalation	0.0083	0.027	0.11
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.13	0.67	3.8
Diet 2	0.047	0.22	1.2
Diet 3	0.059	0.28	1.6

Excess Lifetime Risk [ ]			
Diet 1	1.4E-08	7.6E-07	2.3E-05
Diet 2	5.4E-09	2.5E-07	8.3E-06
Diet 3	8.3E-09	3.3E-07	1.3E-05
Diet 4	4.0E-08	1.7E-06	6.8E-05

Relative Risk [ ]			
Diet 1	1.000024	1.00063	1.018
Diet 2	1.000008	1.00022	1.0062
Diet 3	1.000011	1.00026	1.008
Diet 4	1.000041	1.0016	1.045

Probability of Causation [%]			
Diet 1	0.002	0.063	1.73
Diet 2	0.001	0.022	0.62
Diet 3	0.001	0.026	0.79
Diet 4	0.004	0.157	4.31

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.15	0.74	4
Commercial Milk (locally produced)	0.026	0.16	0.98
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.25	1.8	13
Beef (locally produced)	0.00038	0.0063	0.13
Leafy Vegetables (locally produced)	0.00015	0.0016	0.013
Eggs (locally produced)	0.0093	0.063	0.4
Cottage Cheese (locally produced)	0.00037	0.0037	0.036
Inhalation	0.01	0.032	0.11
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.18	0.87	4.6
Diet 2	0.06	0.28	1.5
Diet 3	0.053	0.24	1.4

Excess Lifetime Risk [ ]			
Diet 1	2.2E-07	3.3E-06	4.7E-05
Diet 2	7.7E-08	1.1E-06	1.5E-05
Diet 3	6.6E-08	9.0E-07	1.3E-05
Diet 4	4.0E-07	7.2E-06	1.2E-04

Relative Risk [ ]			
Diet 1	1.00013	1.0012	1.012
Diet 2	1.000047	1.00041	1.0043
Diet 3	1.000039	1.00035	1.004
Diet 4	1.00028	1.0026	1.04

Probability of Causation [%]			
Diet 1	0.013	0.124	1.18
Diet 2	0.005	0.041	0.43
Diet 3	0.004	0.035	0.40
Diet 4	0.028	0.256	3.81

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**  
**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.18	0.89	4.8
Commercial Milk (locally produced)	0.032	0.19	1.2
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.34	2.5	17
Beef (locally produced)	0.00059	0.0098	0.21
Leafy Vegetables (locally produced)	0.00016	0.0016	0.013
Eggs (locally produced)	0.01	0.069	0.41
Cottage Cheese (locally produced)	0.00037	0.0037	0.039
Inhalation	0.012	0.041	0.15
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.21	1	5.5
Diet 2	0.077	0.35	1.8
Diet 3	0.067	0.3	1.6

Excess Lifetime Risk [ ]			
Diet 1	2.2E-08	1.2E-06	3.8E-05
Diet 2	8.9E-09	4.2E-07	1.4E-05
Diet 3	8.9E-09	3.6E-07	1.3E-05
Diet 4	5.6E-08	2.7E-06	1.1E-04

Relative Risk [ ]			
Diet 1	1.000044	1.00098	1.028
Diet 2	1.000013	1.00032	1.0095
Diet 3	1.000012	1.00028	1.0086
Diet 4	1.000069	1.0024	1.071

Probability of Causation [%]			
Diet 1	0.004	0.098	2.72
Diet 2	0.001	0.032	0.95
Diet 3	0.001	0.028	0.85
Diet 4	0.007	0.239	6.60

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.089	0.45	2.3
Commercial Milk (locally produced)	0.015	0.096	0.63
Commercial Milk (regionally mixed)	0.037	0.21	1.3
Goat Milk (locally produced)	0.16	1.1	8.2
Beef (locally produced)	0.00023	0.0039	0.087
Leafy Vegetables (locally produced)	0.0001	0.00099	0.0083
Eggs (locally produced)	0.0056	0.038	0.24
Cottage Cheese (locally produced)	0.00023	0.0023	0.022
Inhalation	0.0051	0.017	0.065
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.11	0.52	2.6
Diet 2	0.038	0.17	0.97
Diet 3	0.045	0.22	1.4

Excess Lifetime Risk [ ]			
Diet 1	1.1E-07	2.0E-06	3.2E-05
Diet 2	4.6E-08	6.5E-07	9.3E-06
Diet 3	5.7E-08	8.3E-07	1.3E-05
Diet 4	2.6E-07	4.4E-06	6.9E-05

Relative Risk [ ]			
Diet 1	1.000087	1.00074	1.0077
Diet 2	1.00003	1.00025	1.003
Diet 3	1.000035	1.00033	1.0039
Diet 4	1.00016	1.0016	1.023

Probability of Causation [%]			
Diet 1	0.009	0.074	0.76
Diet 2	0.003	0.025	0.30
Diet 3	0.003	0.033	0.39
Diet 4	0.016	0.165	2.27

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**  
**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.11	0.54	2.7
Commercial Milk (locally produced)	0.02	0.12	0.76
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.23	1.5	11
Beef (locally produced)	0.00037	0.0061	0.14
Leafy Vegetables (locally produced)	0.0001	0.00097	0.0084
Eggs (locally produced)	0.0058	0.042	0.25
Cottage Cheese (locally produced)	0.00023	0.0023	0.023
Inhalation	0.0064	0.023	0.078
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.13	0.63	3
Diet 2	0.045	0.21	1.1
Diet 3	0.054	0.28	1.6

Excess Lifetime Risk [ ]			
Diet 1	1.4E-08	7.7E-07	2.4E-05
Diet 2	6.0E-09	2.6E-07	8.2E-06
Diet 3	8.2E-09	3.3E-07	1.3E-05
Diet 4	3.4E-08	1.7E-06	6.3E-05

Relative Risk [ ]			
Diet 1	1.000024	1.00057	1.015
Diet 2	1.0000076	1.00019	1.0054
Diet 3	1.00001	1.00025	1.0079
Diet 4	1.000039	1.0015	1.043

Probability of Causation [%]			
Diet 1	0.002	0.057	1.46
Diet 2	0.001	0.019	0.53
Diet 3	0.001	0.025	0.79
Diet 4	0.004	0.149	4.10

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.098	0.56	2.9
Commercial Milk (locally produced)	0.02	0.12	0.82
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.15	1.3	10
Beef (locally produced)	0.00028	0.0046	0.088
Leafy Vegetables (locally produced)	0.00012	0.0012	0.0099
Eggs (locally produced)	0.0066	0.047	0.3
Cottage Cheese (locally produced)	0.00026	0.0028	0.026
Inhalation	0.0071	0.025	0.089
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.12	0.67	3.3
Diet 2	0.043	0.22	1.2
Diet 3	0.049	0.23	1.4

Excess Lifetime Risk [ ]			
Diet 1	1.5E-07	2.5E-06	3.9E-05
Diet 2	5.7E-08	8.3E-07	1.2E-05
Diet 3	6.2E-08	8.6E-07	1.3E-05
Diet 4	3.0E-07	5.3E-06	1.1E-04

Relative Risk [ ]			
Diet 1	1.00011	1.00093	1.0092
Diet 2	1.000039	1.0003	1.0035
Diet 3	1.000039	1.00034	1.004
Diet 4	1.00018	1.0019	1.029

Probability of Causation [%]			
Diet 1	0.011	0.093	0.91
Diet 2	0.004	0.030	0.35
Diet 3	0.004	0.034	0.40
Diet 4	0.018	0.194	2.86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.12	0.65	3.3
Commercial Milk (locally produced)	0.023	0.15	0.92
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.22	1.9	14
Beef (locally produced)	0.00047	0.0073	0.14
Leafy Vegetables (locally produced)	0.00012	0.0012	0.0099
Eggs (locally produced)	0.0072	0.05	0.33
Cottage Cheese (locally produced)	0.00026	0.0028	0.027
Inhalation	0.009	0.033	0.12
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.14	0.78	3.8
Diet 2	0.052	0.26	1.4
Diet 3	0.06	0.29	1.6

Excess Lifetime Risk [ ]			
Diet 1	1.7E-08	9.9E-07	2.6E-05
Diet 2	7.2E-09	3.1E-07	9.9E-06
Diet 3	8.8E-09	3.5E-07	1.3E-05
Diet 4	4.3E-08	2.0E-06	7.3E-05

Relative Risk [ ]			
Diet 1	1.00003	1.00076	1.02
Diet 2	1.00001	1.00024	1.0067
Diet 3	1.000011	1.00026	1.0084
Diet 4	1.00005	1.0019	1.047

Probability of Causation [%]			
Diet 1	0.003	0.076	1.94
Diet 2	0.001	0.024	0.66
Diet 3	0.001	0.026	0.83
Diet 4	0.005	0.188	4.49

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.18	0.95	5.1
Commercial Milk (locally produced)	0.033	0.2	1.3
Commercial Milk (regionally mixed)	0.037	0.21	1.3
Goat Milk (locally produced)	0.33	2.3	17
Beef (locally produced)	0.00048	0.0079	0.16
Leafy Vegetables (locally produced)	0.0002	0.002	0.017
Eggs (locally produced)	0.012	0.08	0.5
Cottage Cheese (locally produced)	0.00049	0.0047	0.044
Inhalation	0.012	0.04	0.15
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.21	1.1	5.9
Diet 2	0.072	0.36	2
Diet 3	0.055	0.24	1.5

Excess Lifetime Risk [ ]			
Diet 1	2.6E-07	4.0E-06	6.1E-05
Diet 2	9.2E-08	1.4E-06	1.9E-05
Diet 3	7.0E-08	9.3E-07	1.3E-05
Diet 4	5.3E-07	9.2E-06	1.4E-04

Relative Risk [ ]			
Diet 1	1.00018	1.0016	1.015
Diet 2	1.000062	1.00051	1.0051
Diet 3	1.000042	1.00037	1.0041
Diet 4	1.00035	1.0033	1.048

Probability of Causation [%]			
Diet 1	0.018	0.155	1.47
Diet 2	0.006	0.051	0.50
Diet 3	0.004	0.036	0.41
Diet 4	0.035	0.331	4.55

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.21	1.1	6
Commercial Milk (locally produced)	0.042	0.25	1.6
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.45	3.1	20
Beef (locally produced)	0.00077	0.012	0.26
Leafy Vegetables (locally produced)	0.0002	0.002	0.017
Eggs (locally produced)	0.013	0.087	0.55
Cottage Cheese (locally produced)	0.00048	0.0047	0.048
Inhalation	0.015	0.051	0.18
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.26	1.3	6.9
Diet 2	0.092	0.44	2.4
Diet 3	0.07	0.31	1.7

Excess Lifetime Risk [ ]			
Diet 1	2.6E-08	1.6E-06	4.7E-05
Diet 2	1.1E-08	5.4E-07	1.7E-05
Diet 3	9.4E-09	3.8E-07	1.3E-05
Diet 4	6.5E-08	3.5E-06	1.3E-04

Relative Risk [ ]			
Diet 1	1.000057	1.0012	1.033
Diet 2	1.000018	1.00039	1.012
Diet 3	1.000012	1.00028	1.0089
Diet 4	1.000089	1.003	1.085

Probability of Causation [%]			
Diet 1	0.006	0.121	3.17
Diet 2	0.002	0.039	1.18
Diet 3	0.001	0.028	0.89
Diet 4	0.009	0.301	7.86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.089	0.46	2.6
Commercial Milk (locally produced)	0.015	0.096	0.6
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.15	1.1	8.2
Beef (locally produced)	0.00025	0.0038	0.08
Leafy Vegetables (locally produced)	0.000091	0.00098	0.0081
Eggs (locally produced)	0.0055	0.039	0.23
Cottage Cheese (locally produced)	0.00021	0.0023	0.022
Inhalation	0.0061	0.021	0.085
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.11	0.54	2.9
Diet 2	0.037	0.18	0.94
Diet 3	0.047	0.23	1.4

Excess Lifetime Risk [ ]			
Diet 1	1.3E-07	2.1E-06	3.6E-05
Diet 2	4.7E-08	7.1E-07	1.1E-05
Diet 3	5.9E-08	8.4E-07	1.3E-05
Diet 4	2.8E-07	4.6E-06	7.1E-05

Relative Risk [ ]			
Diet 1	1.000089	1.00071	1.0073
Diet 2	1.000029	1.00024	1.0027
Diet 3	1.000036	1.00034	1.004
Diet 4	1.00015	1.0017	1.023

Probability of Causation [%]			
Diet 1	0.009	0.070	0.72
Diet 2	0.003	0.024	0.27
Diet 3	0.004	0.034	0.40
Diet 4	0.015	0.168	2.26

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.11	0.55	2.9
Commercial Milk (locally produced)	0.019	0.12	0.78
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.2	1.6	10
Beef (locally produced)	0.0004	0.0061	0.13
Leafy Vegetables (locally produced)	0.000092	0.00098	0.0086
Eggs (locally produced)	0.0061	0.042	0.27
Cottage Cheese (locally produced)	0.00021	0.0023	0.021
Inhalation	0.0077	0.027	0.1
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.13	0.65	3.3
Diet 2	0.046	0.22	1.2
Diet 3	0.057	0.29	1.6

Excess Lifetime Risk [ ]			
Diet 1	1.4E-08	8.0E-07	2.3E-05
Diet 2	6.6E-09	2.6E-07	8.2E-06
Diet 3	8.4E-09	3.3E-07	1.3E-05
Diet 4	3.8E-08	1.7E-06	7.0E-05

Relative Risk [ ]			
Diet 1	1.000026	1.00063	1.017
Diet 2	1.0000087	1.00021	1.0056
Diet 3	1.000011	1.00026	1.0081
Diet 4	1.000052	1.0015	1.045

Probability of Causation [%]			
Diet 1	0.003	0.063	1.70
Diet 2	0.001	0.021	0.56
Diet 3	0.001	0.026	0.80
Diet 4	0.005	0.154	4.35

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**  
**Receptor: Female born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.17	0.87	4.6
Commercial Milk (locally produced)	0.031	0.18	1.1
Commercial Milk (regionally mixed)	0.037	0.2	1.3
Goat Milk (locally produced)	0.31	2.1	15
Beef (locally produced)	0.00044	0.0072	0.15
Leafy Vegetables (locally produced)	0.00017	0.0018	0.015
Eggs (locally produced)	0.011	0.072	0.45
Cottage Cheese (locally produced)	0.00044	0.0043	0.041
Inhalation	0.011	0.035	0.12
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.21	1	5.4
Diet 2	0.069	0.32	1.8
Diet 3	0.054	0.24	1.4

Excess Lifetime Risk [ ]			
Diet 1	2.6E-07	3.8E-06	5.3E-05
Diet 2	8.6E-08	1.2E-06	1.7E-05
Diet 3	6.6E-08	9.2E-07	1.3E-05
Diet 4	4.9E-07	8.6E-06	1.3E-04

Relative Risk [ ]			
Diet 1	1.00015	1.0014	1.014
Diet 2	1.000055	1.00047	1.0049
Diet 3	1.00004	1.00036	1.0041
Diet 4	1.00032	1.003	1.043

Probability of Causation [%]			
Diet 1	0.015	0.141	1.35
Diet 2	0.005	0.047	0.48
Diet 3	0.004	0.036	0.41
Diet 4	0.032	0.297	4.15

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**

**Receptor: Male born in 1920**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.21	1	5.5
Commercial Milk (locally produced)	0.039	0.22	1.3
Commercial Milk (regionally mixed)	0.045	0.25	1.5
Goat Milk (locally produced)	0.42	2.9	19
Beef (locally produced)	0.00069	0.011	0.24
Leafy Vegetables (locally produced)	0.00018	0.0018	0.015
Eggs (locally produced)	0.012	0.079	0.48
Cottage Cheese (locally produced)	0.00043	0.0042	0.041
Inhalation	0.013	0.045	0.15
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.25	1.2	6.3
Diet 2	0.089	0.4	2.1
Diet 3	0.067	0.3	1.6

Excess Lifetime Risk [ ]			
Diet 1	2.6E-08	1.4E-06	4.3E-05
Diet 2	1.0E-08	4.7E-07	1.7E-05
Diet 3	9.1E-09	3.7E-07	1.3E-05
Diet 4	6.1E-08	3.2E-06	1.2E-04

Relative Risk [ ]			
Diet 1	1.000052	1.0011	1.03
Diet 2	1.000016	1.00036	1.011
Diet 3	1.000012	1.00028	1.0087
Diet 4	1.000081	1.0028	1.081

Probability of Causation [%]			
Diet 1	0.005	0.113	2.92
Diet 2	0.002	0.036	1.05
Diet 3	0.001	0.028	0.86
Diet 4	0.008	0.281	7.51

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.5	8	49
Commercial Milk (locally produced)	0.28	1.8	12
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	2.8	21	140
Beef (locally produced)	0.0042	0.064	1.3
Leafy Vegetables (locally produced)	0.0015	0.017	0.15
Eggs (locally produced)	0.094	0.69	4.5
Cottage Cheese (locally produced)	0.0035	0.038	0.46
Inhalation	0.069	0.22	0.76
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.8	9.2	55
Diet 2	0.57	3.1	17
Diet 3	0.14	0.5	2.2

Excess Lifetime Risk [ ]			
Diet 1	4.7E-06	7.0E-05	9.5E-04
Diet 2	1.7E-06	2.5E-05	3.0E-04
Diet 3	3.8E-07	3.7E-06	4.0E-05
Diet 4	1.2E-05	1.7E-04	2.4E-03

Relative Risk [ ]			
Diet 1	1.002	1.019	1.21
Diet 2	1.00077	1.0067	1.084
Diet 3	1.00014	1.0011	1.011
Diet 4	1.0049	1.044	1.63

Probability of Causation [%]			
Diet 1	0.200	1.820	17.42
Diet 2	0.077	0.665	7.73
Diet 3	0.014	0.107	1.08
Diet 4	0.491	4.222	38.39

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.9	9.9	58
Commercial Milk (locally produced)	0.37	2.3	14
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	3.9	28	180
Beef (locally produced)	0.0065	0.1	2.1
Leafy Vegetables (locally produced)	0.0015	0.016	0.15
Eggs (locally produced)	0.1	0.74	4.8
Cottage Cheese (locally produced)	0.0032	0.038	0.41
Inhalation	0.078	0.27	0.91
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2.2	11	66
Diet 2	0.71	3.8	21
Diet 3	0.15	0.62	2.5

Excess Lifetime Risk [ ]			
Diet 1	4.9E-07	2.2E-05	6.4E-04
Diet 2	1.8E-07	7.7E-06	2.5E-04
Diet 3	3.7E-08	1.2E-06	3.4E-05
Diet 4	1.4E-06	5.3E-05	1.8E-03

Relative Risk [ ]			
Diet 1	1.00078	1.016	1.41
Diet 2	1.00026	1.0053	1.12
Diet 3	1.000048	1.00082	1.017
Diet 4	1.0015	1.039	1.98

Probability of Causation [%]			
Diet 1	0.078	1.529	28.96
Diet 2	0.026	0.526	10.91
Diet 3	0.005	0.082	1.69
Diet 4	0.146	3.791	49.45

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.8	10	60
Commercial Milk (locally produced)	0.4	2.3	14
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	3.2	26	180
Beef (locally produced)	0.0049	0.078	1.7
Leafy Vegetables (locally produced)	0.0019	0.021	0.17
Eggs (locally produced)	0.13	0.83	5.2
Cottage Cheese (locally produced)	0.0043	0.047	0.52
Inhalation	0.083	0.27	0.92
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2.1	12	69
Diet 2	0.74	3.8	19
Diet 3	0.16	0.56	2.3

Excess Lifetime Risk [ ]			
Diet 1	5.2E-06	8.7E-05	1.1E-03
Diet 2	2.1E-06	2.9E-05	3.7E-04
Diet 3	4.3E-07	4.2E-06	4.4E-05
Diet 4	1.4E-05	2.0E-04	2.8E-03

Relative Risk [ ]			
Diet 1	1.0024	1.023	1.27
Diet 2	1.00095	1.0086	1.097
Diet 3	1.00016	1.0012	1.012
Diet 4	1.0059	1.057	1.79

Probability of Causation [%]			
Diet 1	0.238	2.218	20.96
Diet 2	0.095	0.853	8.80
Diet 3	0.016	0.117	1.14
Diet 4	0.587	5.378	44.05

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.3	12	65
Commercial Milk (locally produced)	0.5	2.7	16
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	4.3	35	220
Beef (locally produced)	0.0075	0.13	2.7
Leafy Vegetables (locally produced)	0.0018	0.021	0.17
Eggs (locally produced)	0.14	0.89	5.6
Cottage Cheese (locally produced)	0.0042	0.048	0.47
Inhalation	0.096	0.34	1.1
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2.6	14	74
Diet 2	0.87	4.6	24
Diet 3	0.17	0.7	2.7

Excess Lifetime Risk [ ]			
Diet 1	6.3E-07	2.8E-05	7.2E-04
Diet 2	2.1E-07	9.7E-06	3.1E-04
Diet 3	4.1E-08	1.3E-06	3.6E-05
Diet 4	1.8E-06	6.4E-05	2.1E-03

Relative Risk [ ]			
Diet 1	1.00095	1.018	1.46
Diet 2	1.00032	1.0063	1.15
Diet 3	1.000052	1.00092	1.018
Diet 4	1.0017	1.05	2.2

Probability of Causation [%]			
Diet 1	0.095	1.740	31.53
Diet 2	0.032	0.628	12.82
Diet 3	0.005	0.092	1.77
Diet 4	0.168	4.770	54.40

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.39	2.1	13
Commercial Milk (locally produced)	0.07	0.48	3.1
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0011	0.017	0.38
Leafy Vegetables (locally produced)	0.00038	0.0044	0.039
Eggs (locally produced)	0.024	0.18	1.1
Cottage Cheese (locally produced)	0.00093	0.0099	0.13
Inhalation	0.018	0.06	0.2
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.46	2.4	15
Diet 2	0.14	0.81	4.6
Diet 3	0.07	0.32	1.7

Excess Lifetime Risk [ ]			
Diet 1	1.2E-06	1.8E-05	2.4E-04
Diet 2	4.6E-07	6.3E-06	7.7E-05
Diet 3	2.0E-07	2.5E-06	3.1E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.00049	1.0048	1.057
Diet 2	1.00019	1.0017	1.023
Diet 3	1.000087	1.00072	1.0084
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.049	0.477	5.33
Diet 2	0.019	0.175	2.25
Diet 3	0.009	0.072	0.83
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.48	2.6	15
Commercial Milk (locally produced)	0.095	0.59	3.8
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0017	0.027	0.58
Leafy Vegetables (locally produced)	0.0004	0.0042	0.037
Eggs (locally produced)	0.026	0.19	1.2
Cottage Cheese (locally produced)	0.00085	0.0099	0.11
Inhalation	0.019	0.073	0.25
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.56	3	17
Diet 2	0.18	0.97	5.4
Diet 3	0.084	0.38	2.1

Excess Lifetime Risk [ ]			
Diet 1	1.2E-07	5.8E-06	1.7E-04
Diet 2	4.5E-08	2.1E-06	6.4E-05
Diet 3	2.2E-08	8.2E-07	2.6E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.00019	1.0039	1.11
Diet 2	1.000067	1.0014	1.033
Diet 3	1.000028	1.00054	1.012
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.019	0.385	9.69
Diet 2	0.007	0.135	3.21
Diet 3	0.003	0.054	1.23
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1	5.7	33
Commercial Milk (locally produced)	0.2	1.3	8.5
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0027	0.046	1
Leafy Vegetables (locally produced)	0.0011	0.012	0.1
Eggs (locally produced)	0.07	0.47	3
Cottage Cheese (locally produced)	0.0026	0.028	0.33
Inhalation	0.049	0.16	0.55
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.2	6.6	38
Diet 2	0.42	2.1	12
Diet 3	0.11	0.43	2

Excess Lifetime Risk [ ]			
Diet 1	3.0E-06	4.7E-05	6.7E-04
Diet 2	1.2E-06	1.7E-05	2.2E-04
Diet 3	3.1E-07	3.3E-06	3.7E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.0013	1.013	1.14
Diet 2	1.0005	1.0048	1.061
Diet 3	1.00012	1.00094	1.0096
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.125	1.329	12.18
Diet 2	0.050	0.482	5.72
Diet 3	0.012	0.094	0.95
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.3	6.9	42
Commercial Milk (locally produced)	0.26	1.6	11
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0043	0.073	1.7
Leafy Vegetables (locally produced)	0.0011	0.012	0.1
Eggs (locally produced)	0.07	0.51	3.3
Cottage Cheese (locally produced)	0.0024	0.028	0.31
Inhalation	0.056	0.19	0.64
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.5	7.9	46
Diet 2	0.51	2.6	15
Diet 3	0.14	0.54	2.4

Excess Lifetime Risk [ ]			
Diet 1	3.1E-07	1.5E-05	4.5E-04
Diet 2	1.2E-07	5.6E-06	1.6E-04
Diet 3	3.2E-08	1.1E-06	3.0E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.00055	1.01	1.27
Diet 2	1.00017	1.0037	1.084
Diet 3	1.000041	1.00072	1.016
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.055	1.036	21.41
Diet 2	0.017	0.371	7.72
Diet 3	0.004	0.072	1.57
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1	5.7	33
Commercial Milk (locally produced)	0.21	1.3	8.3
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	1.8	14	100
Beef (locally produced)	0.0027	0.045	0.96
Leafy Vegetables (locally produced)	0.0011	0.012	0.098
Eggs (locally produced)	0.069	0.47	2.9
Cottage Cheese (locally produced)	0.0025	0.027	0.3
Inhalation	0.05	0.16	0.56
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.2	6.5	38
Diet 2	0.41	2.1	12
Diet 3	0.11	0.43	2

Excess Lifetime Risk [ ]			
Diet 1	2.9E-06	4.8E-05	6.9E-04
Diet 2	1.2E-06	1.7E-05	2.1E-04
Diet 3	3.1E-07	3.3E-06	3.7E-05
Diet 4	7.8E-06	1.2E-04	1.6E-03

Relative Risk [ ]			
Diet 1	1.0013	1.013	1.14
Diet 2	1.00051	1.0048	1.056
Diet 3	1.00012	1.00094	1.0097
Diet 4	1.0033	1.03	1.46

Probability of Causation [%]			
Diet 1	0.125	1.299	12.01
Diet 2	0.051	0.477	5.30
Diet 3	0.012	0.094	0.96
Diet 4	0.326	2.931	31.56

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.3	6.8	42
Commercial Milk (locally produced)	0.27	1.5	10
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	2.6	20	120
Beef (locally produced)	0.0042	0.071	1.5
Leafy Vegetables (locally produced)	0.0011	0.012	0.098
Eggs (locally produced)	0.071	0.5	3.3
Cottage Cheese (locally produced)	0.0024	0.027	0.28
Inhalation	0.056	0.19	0.65
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.5	7.8	46
Diet 2	0.51	2.5	15
Diet 3	0.14	0.54	2.4

Excess Lifetime Risk [ ]			
Diet 1	3.1E-07	1.5E-05	4.3E-04
Diet 2	1.1E-07	5.6E-06	1.7E-04
Diet 3	3.1E-08	1.1E-06	3.0E-05
Diet 4	9.3E-07	3.6E-05	1.2E-03

Relative Risk [ ]			
Diet 1	1.00055	1.01	1.26
Diet 2	1.00018	1.0036	1.081
Diet 3	1.000041	1.00072	1.016
Diet 4	1.00092	1.027	1.68

Probability of Causation [%]			
Diet 1	0.055	0.999	20.46
Diet 2	0.018	0.359	7.45
Diet 3	0.004	0.072	1.56
Diet 4	0.092	2.670	40.28

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.14	0.78	4.9
Commercial Milk (locally produced)	0.026	0.19	1.3
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.26	2.1	17
Beef (locally produced)	0.00039	0.0066	0.14
Leafy Vegetables (locally produced)	0.00015	0.0017	0.016
Eggs (locally produced)	0.0092	0.068	0.44
Cottage Cheese (locally produced)	0.00033	0.0039	0.049
Inhalation	0.0071	0.024	0.092
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.17	0.91	5.6
Diet 2	0.058	0.31	2
Diet 3	0.057	0.28	1.6

Excess Lifetime Risk [ ]			
Diet 1	4.7E-07	6.9E-06	1.0E-04
Diet 2	1.8E-07	2.5E-06	3.5E-05
Diet 3	1.7E-07	2.2E-06	3.0E-05
Diet 4	1.2E-06	1.6E-05	2.5E-04

Relative Risk [ ]			
Diet 1	1.00017	1.0018	1.024
Diet 2	1.00007	1.00064	1.01
Diet 3	1.000074	1.00064	1.008
Diet 4	1.00042	1.0043	1.076

Probability of Causation [%]			
Diet 1	0.017	0.181	2.34
Diet 2	0.007	0.064	1.03
Diet 3	0.007	0.064	0.79
Diet 4	0.042	0.426	7.08

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.18	0.96	6
Commercial Milk (locally produced)	0.034	0.22	1.6
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.33	2.7	21
Beef (locally produced)	0.00056	0.01	0.21
Leafy Vegetables (locally produced)	0.00015	0.0017	0.016
Eggs (locally produced)	0.0099	0.07	0.51
Cottage Cheese (locally produced)	0.00032	0.0037	0.045
Inhalation	0.0087	0.029	0.11
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.22	1.1	6.9
Diet 2	0.07	0.37	2.4
Diet 3	0.07	0.33	2

Excess Lifetime Risk [ ]			
Diet 1	4.3E-08	2.2E-06	7.0E-05
Diet 2	1.7E-08	7.5E-07	2.7E-05
Diet 3	1.9E-08	7.2E-07	2.4E-05
Diet 4	1.3E-07	5.0E-06	1.9E-04

Relative Risk [ ]			
Diet 1	1.000071	1.0016	1.039
Diet 2	1.000023	1.00055	1.013
Diet 3	1.000024	1.00048	1.011
Diet 4	1.00014	1.0041	1.1

Probability of Causation [%]			
Diet 1	0.007	0.158	3.72
Diet 2	0.002	0.055	1.27
Diet 3	0.002	0.048	1.11
Diet 4	0.014	0.411	9.47

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0018	0.02	0.23
Inhalation	0.036	0.12	0.41
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.097	0.39	1.9

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.7E-07	3.0E-06	3.4E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00011	1.00084	1.0092
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.011	0.084	0.92
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways  
Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways  
Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)  
Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0017	0.02	0.21
Inhalation	0.041	0.15	0.49
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.11	0.48	2.3

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.8E-08	9.6E-07	2.9E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.000036	1.00065	1.014
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.004	0.065	1.41
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1	5.3	29
Commercial Milk (locally produced)	0.21	1.2	8.3
Commercial Milk (regionally mixed)	0.042	0.25	1.5
Goat Milk (locally produced)	1.8	13	95
Beef (locally produced)	0.0026	0.044	0.86
Leafy Vegetables (locally produced)	0.0012	0.011	0.091
Eggs (locally produced)	0.072	0.44	2.8
Cottage Cheese (locally produced)	0.0023	0.026	0.26
Inhalation	0.05	0.16	0.54
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.2	6.1	33
Diet 2	0.42	2	11
Diet 3	0.11	0.43	2

Excess Lifetime Risk [ ]			
Diet 1	2.9E-06	4.5E-05	6.7E-04
Diet 2	1.1E-06	1.6E-05	2.0E-04
Diet 3	3.1E-07	3.3E-06	3.5E-05
Diet 4	7.9E-06	1.1E-04	1.7E-03

Relative Risk [ ]			
Diet 1	1.0012	1.012	1.13
Diet 2	1.0005	1.0046	1.055
Diet 3	1.00013	1.00093	1.0099
Diet 4	1.0033	1.03	1.4

Probability of Causation [%]			
Diet 1	0.123	1.216	11.61
Diet 2	0.050	0.454	5.22
Diet 3	0.013	0.093	0.98
Diet 4	0.327	2.943	28.73

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.3	6.4	34
Commercial Milk (locally produced)	0.26	1.4	9.4
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	2.6	19	110
Beef (locally produced)	0.0039	0.069	1.4
Leafy Vegetables (locally produced)	0.0012	0.011	0.089
Eggs (locally produced)	0.072	0.48	3
Cottage Cheese (locally produced)	0.0023	0.025	0.24
Inhalation	0.055	0.18	0.69
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.5	7.3	38
Diet 2	0.5	2.4	14
Diet 3	0.13	0.54	2.3

Excess Lifetime Risk [ ]			
Diet 1	3.0E-07	1.5E-05	4.0E-04
Diet 2	1.0E-07	5.0E-06	1.5E-04
Diet 3	3.0E-08	1.1E-06	3.0E-05
Diet 4	8.7E-07	3.3E-05	1.1E-03

Relative Risk [ ]			
Diet 1	1.0005	1.0098	1.23
Diet 2	1.00017	1.0035	1.08
Diet 3	1.000041	1.0007	1.015
Diet 4	1.001	1.027	1.67

Probability of Causation [%]			
Diet 1	0.050	0.968	18.77
Diet 2	0.017	0.348	7.45
Diet 3	0.004	0.070	1.52
Diet 4	0.102	2.613	40.15

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.18	1.1	6.3
Commercial Milk (locally produced)	0.038	0.24	1.8
Commercial Milk (regionally mixed)	0.042	0.25	1.5
Goat Milk (locally produced)	0.38	2.8	21
Beef (locally produced)	0.00057	0.0086	0.18
Leafy Vegetables (locally produced)	0.00021	0.0023	0.021
Eggs (locally produced)	0.012	0.092	0.67
Cottage Cheese (locally produced)	0.00049	0.0051	0.063
Inhalation	0.0095	0.033	0.13
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.21	1.2	7.3
Diet 2	0.081	0.42	2.8
Diet 3	0.062	0.28	1.6

Excess Lifetime Risk [ ]			
Diet 1	6.0E-07	9.0E-06	1.2E-04
Diet 2	2.1E-07	3.3E-06	4.3E-05
Diet 3	1.8E-07	2.3E-06	3.0E-05
Diet 4	1.5E-06	2.4E-05	3.3E-04

Relative Risk [ ]			
Diet 1	1.00025	1.0024	1.03
Diet 2	1.00011	1.00091	1.014
Diet 3	1.00008	1.00066	1.0079
Diet 4	1.00069	1.0058	1.095

Probability of Causation [%]			
Diet 1	0.025	0.243	2.91
Diet 2	0.011	0.091	1.36
Diet 3	0.008	0.066	0.78
Diet 4	0.069	0.576	8.65

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.21	1.3	7.4
Commercial Milk (locally produced)	0.049	0.3	2.1
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.5	3.8	27
Beef (locally produced)	0.00091	0.014	0.28
Leafy Vegetables (locally produced)	0.00021	0.0023	0.021
Eggs (locally produced)	0.013	0.097	0.69
Cottage Cheese (locally produced)	0.00048	0.0051	0.057
Inhalation	0.011	0.041	0.15
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.26	1.5	8.3
Diet 2	0.11	0.5	3.3
Diet 3	0.075	0.34	2

Excess Lifetime Risk [ ]			
Diet 1	6.0E-08	2.9E-06	8.8E-05
Diet 2	2.3E-08	1.1E-06	3.5E-05
Diet 3	2.0E-08	7.5E-07	2.5E-05
Diet 4	1.7E-07	6.8E-06	2.4E-04

Relative Risk [ ]			
Diet 1	1.0001	1.002	1.059
Diet 2	1.000032	1.00075	1.017
Diet 3	1.000025	1.00049	1.011
Diet 4	1.0002	1.0055	1.13

Probability of Causation [%]			
Diet 1	0.010	0.200	5.55
Diet 2	0.003	0.075	1.66
Diet 3	0.002	0.049	1.12
Diet 4	0.020	0.546	11.19

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0011	0.012	0.13
Inhalation	0.021	0.069	0.25
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.077	0.33	1.7

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.1E-07	2.6E-06	3.2E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.000094	1.00074	1.0084
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.009	0.074	0.84
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways  
Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways  
Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)  
Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0011	0.012	0.12
Inhalation	0.025	0.084	0.29
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.094	0.4	2.1

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.3E-08	8.5E-07	2.6E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00003	1.00056	1.013
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.003	0.056	1.27
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways  
Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways  
Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)  
Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.17	1	7.2
Commercial Milk (locally produced)	0.036	0.23	1.7
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.33	2.7	22
Beef (locally produced)	0.0005	0.0083	0.19
Leafy Vegetables (locally produced)	0.00022	0.0021	0.018
Eggs (locally produced)	0.011	0.086	0.57
Cottage Cheese (locally produced)	0.0004	0.0052	0.07
Inhalation	0.009	0.032	0.12
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.21	1.2	7.9
Diet 2	0.074	0.39	2.5
Diet 3	0.059	0.28	1.6

Excess Lifetime Risk [ ]			
Diet 1	5.6E-07	8.8E-06	1.4E-04
Diet 2	2.3E-07	3.2E-06	4.3E-05
Diet 3	1.7E-07	2.3E-06	3.0E-05
Diet 4	1.5E-06	2.2E-05	3.7E-04

Relative Risk [ ]			
Diet 1	1.00023	1.0023	1.029
Diet 2	1.000095	1.00084	1.011
Diet 3	1.000077	1.00066	1.008
Diet 4	1.00064	1.0056	1.085

Probability of Causation [%]			
Diet 1	0.023	0.230	2.81
Diet 2	0.010	0.084	1.10
Diet 3	0.008	0.066	0.80
Diet 4	0.064	0.557	7.84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.21	1.2	8.3
Commercial Milk (locally produced)	0.046	0.28	2.1
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.45	3.5	27
Beef (locally produced)	0.00077	0.013	0.32
Leafy Vegetables (locally produced)	0.00022	0.0021	0.019
Eggs (locally produced)	0.012	0.092	0.65
Cottage Cheese (locally produced)	0.00044	0.0049	0.059
Inhalation	0.01	0.038	0.14
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.25	1.4	9.4
Diet 2	0.086	0.47	3
Diet 3	0.074	0.34	2

Excess Lifetime Risk [ ]			
Diet 1	6.0E-08	2.7E-06	8.6E-05
Diet 2	2.2E-08	9.6E-07	2.8E-05
Diet 3	1.9E-08	7.5E-07	2.5E-05
Diet 4	1.7E-07	6.5E-06	2.5E-04

Relative Risk [ ]			
Diet 1	1.000092	1.0019	1.054
Diet 2	1.00003	1.0007	1.017
Diet 3	1.000024	1.00049	1.012
Diet 4	1.00021	1.0051	1.14

Probability of Causation [%]			
Diet 1	0.009	0.188	5.11
Diet 2	0.003	0.070	1.68
Diet 3	0.002	0.049	1.14
Diet 4	0.021	0.506	12.49

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0016	0.017	0.18
Inhalation	0.034	0.11	0.37
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.093	0.37	1.8

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.6E-07	2.9E-06	3.3E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00011	1.00082	1.009
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.011	0.082	0.89
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways  
Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways  
Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)  
Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0016	0.017	0.17
Inhalation	0.038	0.13	0.45
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.11	0.46	2.2

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.6E-08	9.4E-07	2.8E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.000035	1.00062	1.014
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.003	0.062	1.38
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.92	5.1	28
Commercial Milk (locally produced)	0.19	1.2	7.6
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	1.9	13	90
Beef (locally produced)	0.0026	0.04	0.79
Leafy Vegetables (locally produced)	0.001	0.011	0.088
Eggs (locally produced)	0.061	0.42	2.6
Cottage Cheese (locally produced)	0.0023	0.025	0.26
Inhalation	0.047	0.15	0.55
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.1	5.8	33
Diet 2	0.38	2	11
Diet 3	0.11	0.42	2

Excess Lifetime Risk [ ]			
Diet 1	2.8E-06	4.2E-05	5.4E-04
Diet 2	1.1E-06	1.5E-05	2.0E-04
Diet 3	3.2E-07	3.3E-06	3.6E-05
Diet 4	7.2E-06	1.1E-04	1.5E-03

Relative Risk [ ]			
Diet 1	1.0012	1.012	1.12
Diet 2	1.00051	1.0042	1.052
Diet 3	1.00012	1.00093	1.0096
Diet 4	1.0031	1.027	1.4

Probability of Causation [%]			
Diet 1	0.122	1.170	11.06
Diet 2	0.051	0.415	4.90
Diet 3	0.012	0.093	0.95
Diet 4	0.313	2.588	28.73

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.2	34
Commercial Milk (locally produced)	0.25	1.4	9.2
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	2.5	18	110
Beef (locally produced)	0.0039	0.063	1.3
Leafy Vegetables (locally produced)	0.00099	0.011	0.089
Eggs (locally produced)	0.065	0.45	3
Cottage Cheese (locally produced)	0.0023	0.023	0.25
Inhalation	0.055	0.19	0.63
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.3	7.1	39
Diet 2	0.48	2.3	14
Diet 3	0.14	0.53	2.3

Excess Lifetime Risk [ ]			
Diet 1	2.9E-07	1.4E-05	3.7E-04
Diet 2	1.1E-07	5.0E-06	1.5E-04
Diet 3	3.0E-08	1.1E-06	3.0E-05
Diet 4	8.6E-07	3.2E-05	1.0E-03

Relative Risk [ ]			
Diet 1	1.00051	1.009	1.24
Diet 2	1.00016	1.0033	1.075
Diet 3	1.00004	1.00071	1.015
Diet 4	1.00088	1.025	1.62

Probability of Causation [%]			
Diet 1	0.050	0.894	19.53
Diet 2	0.016	0.325	6.94
Diet 3	0.004	0.070	1.51
Diet 4	0.088	2.407	38.37

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.13	0.77	4.9
Commercial Milk (locally produced)	0.028	0.18	1.3
Commercial Milk (regionally mixed)	0.042	0.25	1.5
Goat Milk (locally produced)	0.25	2	15
Beef (locally produced)	0.00038	0.0064	0.14
Leafy Vegetables (locally produced)	0.00014	0.0017	0.016
Eggs (locally produced)	0.009	0.065	0.45
Cottage Cheese (locally produced)	0.00032	0.0038	0.046
Inhalation	0.0072	0.024	0.093
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.15	0.89	5.5
Diet 2	0.059	0.31	1.8
Diet 3	0.056	0.28	1.6

Excess Lifetime Risk [ ]			
Diet 1	4.0E-07	6.4E-06	9.9E-05
Diet 2	1.8E-07	2.3E-06	3.3E-05
Diet 3	1.7E-07	2.2E-06	3.0E-05
Diet 4	1.0E-06	1.6E-05	2.7E-04

Relative Risk [ ]			
Diet 1	1.00017	1.0018	1.022
Diet 2	1.000067	1.00064	1.009
Diet 3	1.000075	1.00064	1.0079
Diet 4	1.00042	1.0043	1.069

Probability of Causation [%]			
Diet 1	0.017	0.179	2.17
Diet 2	0.007	0.064	0.89
Diet 3	0.007	0.064	0.79
Diet 4	0.042	0.433	6.42

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.16	0.93	5.7
Commercial Milk (locally produced)	0.037	0.22	1.6
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.34	2.6	21
Beef (locally produced)	0.00057	0.01	0.21
Leafy Vegetables (locally produced)	0.00015	0.0016	0.015
Eggs (locally produced)	0.01	0.07	0.5
Cottage Cheese (locally produced)	0.00032	0.0038	0.041
Inhalation	0.0084	0.029	0.11
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.19	1.1	6.4
Diet 2	0.069	0.36	2.3
Diet 3	0.069	0.33	2

Excess Lifetime Risk [ ]			
Diet 1	4.2E-08	2.1E-06	6.1E-05
Diet 2	1.6E-08	7.5E-07	2.3E-05
Diet 3	1.8E-08	7.2E-07	2.4E-05
Diet 4	1.2E-07	5.1E-06	1.7E-04

Relative Risk [ ]			
Diet 1	1.000071	1.0015	1.039
Diet 2	1.000024	1.00053	1.013
Diet 3	1.000023	1.00048	1.011
Diet 4	1.00013	1.0038	1.1

Probability of Causation [%]			
Diet 1	0.007	0.147	3.70
Diet 2	0.002	0.053	1.27
Diet 3	0.002	0.048	1.12
Diet 4	0.013	0.383	9.36

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.87	4.6	26
Commercial Milk (locally produced)	0.17	1.1	6.8
Commercial Milk (regionally mixed)	0.042	0.25	1.5
Goat Milk (locally produced)	1.6	12	80
Beef (locally produced)	0.0022	0.038	0.71
Leafy Vegetables (locally produced)	0.00093	0.0099	0.082
Eggs (locally produced)	0.059	0.38	2.3
Cottage Cheese (locally produced)	0.0021	0.022	0.24
Inhalation	0.045	0.14	0.49
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1	5.3	30
Diet 2	0.36	1.7	10
Diet 3	0.11	0.41	2

Excess Lifetime Risk [ ]			
Diet 1	2.5E-06	4.0E-05	5.2E-04
Diet 2	1.0E-06	1.4E-05	1.8E-04
Diet 3	3.0E-07	3.2E-06	3.5E-05
Diet 4	6.6E-06	9.6E-05	1.4E-03

Relative Risk [ ]			
Diet 1	1.0011	1.011	1.12
Diet 2	1.00044	1.0039	1.048
Diet 3	1.00012	1.00091	1.0097
Diet 4	1.0028	1.025	1.37

Probability of Causation [%]			
Diet 1	0.109	1.064	10.47
Diet 2	0.044	0.388	4.55
Diet 3	0.012	0.091	0.96
Diet 4	0.283	2.437	27.14

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways  
Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways  
Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)  
Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	5.7	31
Commercial Milk (locally produced)	0.22	1.3	8.4
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	2.2	16	99
Beef (locally produced)	0.0033	0.059	1.2
Leafy Vegetables (locally produced)	0.00095	0.0097	0.082
Eggs (locally produced)	0.06	0.42	2.5
Cottage Cheese (locally produced)	0.002	0.022	0.22
Inhalation	0.052	0.17	0.57
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.3	6.5	36
Diet 2	0.45	2.1	12
Diet 3	0.13	0.51	2.3

Excess Lifetime Risk [ ]			
Diet 1	2.9E-07	1.2E-05	3.5E-04
Diet 2	1.0E-07	4.4E-06	1.5E-04
Diet 3	2.9E-08	1.0E-06	2.9E-05
Diet 4	7.6E-07	2.8E-05	9.9E-04

Relative Risk [ ]			
Diet 1	1.00041	1.0084	1.21
Diet 2	1.00014	1.003	1.065
Diet 3	1.00004	1.0007	1.015
Diet 4	1.00076	1.023	1.58

Probability of Causation [%]			
Diet 1	0.041	0.834	17.56
Diet 2	0.014	0.296	6.06
Diet 3	0.004	0.070	1.48
Diet 4	0.076	2.272	36.61

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.35	1.9	11
Commercial Milk (locally produced)	0.072	0.45	3
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.71	4.9	36
Beef (locally produced)	0.00099	0.016	0.31
Leafy Vegetables (locally produced)	0.00038	0.0041	0.035
Eggs (locally produced)	0.024	0.16	1
Cottage Cheese (locally produced)	0.00088	0.0095	0.1
Inhalation	0.018	0.059	0.21
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.42	2.2	13
Diet 2	0.15	0.74	4.6
Diet 3	0.076	0.31	1.7

Excess Lifetime Risk [ ]			
Diet 1	1.1E-06	1.6E-05	2.3E-04
Diet 2	4.3E-07	6.0E-06	7.5E-05
Diet 3	2.1E-07	2.5E-06	3.1E-05
Diet 4	2.8E-06	4.0E-05	5.8E-04

Relative Risk [ ]			
Diet 1	1.00047	1.0045	1.052
Diet 2	1.00019	1.0016	1.021
Diet 3	1.000089	1.00072	1.0084
Diet 4	1.0012	1.01	1.16

Probability of Causation [%]			
Diet 1	0.047	0.445	4.89
Diet 2	0.019	0.161	2.02
Diet 3	0.009	0.072	0.83
Diet 4	0.115	1.011	13.88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.44	2.4	14
Commercial Milk (locally produced)	0.093	0.54	3.7
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.93	6.7	43
Beef (locally produced)	0.0015	0.025	0.51
Leafy Vegetables (locally produced)	0.00038	0.0041	0.036
Eggs (locally produced)	0.025	0.18	1.1
Cottage Cheese (locally produced)	0.00083	0.0092	0.098
Inhalation	0.021	0.073	0.25
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.51	2.7	16
Diet 2	0.19	0.89	5.5
Diet 3	0.088	0.38	2.1

Excess Lifetime Risk [ ]			
Diet 1	1.1E-07	5.2E-06	1.5E-04
Diet 2	4.3E-08	1.8E-06	6.0E-05
Diet 3	2.2E-08	8.1E-07	2.6E-05
Diet 4	3.4E-07	1.2E-05	4.1E-04

Relative Risk [ ]			
Diet 1	1.00018	1.0037	1.097
Diet 2	1.000057	1.0013	1.03
Diet 3	1.000029	1.00054	1.012
Diet 4	1.00032	1.0098	1.23

Probability of Causation [%]			
Diet 1	0.018	0.366	8.72
Diet 2	0.006	0.126	2.91
Diet 3	0.003	0.054	1.19
Diet 4	0.032	0.967	18.51

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.042	0.25	1.5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.00093	0.01	0.11
Inhalation	0.02	0.065	0.23
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.076	0.32	1.7

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.2E-07	2.6E-06	3.2E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00009	1.00073	1.0083
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.009	0.073	0.83
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.00093	0.0099	0.11
Inhalation	0.023	0.079	0.27
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.09	0.39	2.1

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.2E-08	8.3E-07	2.6E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.000029	1.00055	1.012
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.003	0.055	1.22
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.44	2.3	14
Commercial Milk (locally produced)	0.081	0.53	3.5
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.82	5.9	41
Beef (locally produced)	0.0011	0.019	0.41
Leafy Vegetables (locally produced)	0.00051	0.0049	0.043
Eggs (locally produced)	0.027	0.19	1.2
Cottage Cheese (locally produced)	0.0011	0.011	0.13
Inhalation	0.023	0.078	0.26
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.52	2.7	15
Diet 2	0.18	0.89	4.8
Diet 3	0.079	0.34	1.7

Excess Lifetime Risk [ ]			
Diet 1	1.3E-06	1.9E-05	2.8E-04
Diet 2	5.4E-07	7.1E-06	9.1E-05
Diet 3	2.2E-07	2.6E-06	3.2E-05
Diet 4	3.4E-06	4.9E-05	6.7E-04

Relative Risk [ ]			
Diet 1	1.00053	1.0056	1.055
Diet 2	1.00021	1.002	1.024
Diet 3	1.000094	1.00077	1.0084
Diet 4	1.0013	1.013	1.18

Probability of Causation [%]			
Diet 1	0.053	0.556	5.21
Diet 2	0.021	0.199	2.30
Diet 3	0.009	0.077	0.84
Diet 4	0.130	1.272	15.28

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.55	2.9	16
Commercial Milk (locally produced)	0.11	0.65	4.2
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	1.1	8	50
Beef (locally produced)	0.0017	0.031	0.66
Leafy Vegetables (locally produced)	0.00048	0.0048	0.046
Eggs (locally produced)	0.028	0.21	1.3
Cottage Cheese (locally produced)	0.001	0.012	0.13
Inhalation	0.027	0.094	0.32
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.65	3.3	18
Diet 2	0.22	1.1	6
Diet 3	0.099	0.41	2.1

Excess Lifetime Risk [ ]			
Diet 1	1.3E-07	6.3E-06	2.1E-04
Diet 2	5.6E-08	2.3E-06	7.3E-05
Diet 3	2.3E-08	8.5E-07	2.6E-05
Diet 4	4.2E-07	1.5E-05	4.7E-04

Relative Risk [ ]			
Diet 1	1.0002	1.0044	1.11
Diet 2	1.000069	1.0016	1.032
Diet 3	1.000031	1.00057	1.013
Diet 4	1.00038	1.011	1.29

Probability of Causation [%]			
Diet 1	0.020	0.435	10.05
Diet 2	0.007	0.156	3.15
Diet 3	0.003	0.057	1.26
Diet 4	0.038	1.134	22.21

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.49	2.6	15
Commercial Milk (locally produced)	0.095	0.61	3.6
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.95	6.7	49
Beef (locally produced)	0.0013	0.021	0.48
Leafy Vegetables (locally produced)	0.00052	0.0057	0.05
Eggs (locally produced)	0.033	0.22	1.4
Cottage Cheese (locally produced)	0.0012	0.013	0.14
Inhalation	0.026	0.087	0.3
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.6	3	17
Diet 2	0.21	1	5.4
Diet 3	0.086	0.35	1.8

Excess Lifetime Risk [ ]			
Diet 1	1.5E-06	2.2E-05	3.2E-04
Diet 2	5.8E-07	8.0E-06	9.4E-05
Diet 3	2.3E-07	2.7E-06	3.3E-05
Diet 4	3.6E-06	5.5E-05	7.5E-04

Relative Risk [ ]			
Diet 1	1.00064	1.0061	1.064
Diet 2	1.00026	1.0022	1.027
Diet 3	1.000099	1.00078	1.0086
Diet 4	1.0016	1.014	1.21

Probability of Causation [%]			
Diet 1	0.064	0.609	5.97
Diet 2	0.026	0.223	2.62
Diet 3	0.010	0.078	0.85
Diet 4	0.159	1.427	16.98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.63	3.2	17
Commercial Milk (locally produced)	0.13	0.74	4.3
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	1.3	9.2	60
Beef (locally produced)	0.002	0.034	0.85
Leafy Vegetables (locally produced)	0.00047	0.0054	0.049
Eggs (locally produced)	0.035	0.24	1.6
Cottage Cheese (locally produced)	0.0011	0.012	0.12
Inhalation	0.028	0.11	0.35
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.76	3.6	20
Diet 2	0.25	1.2	6.5
Diet 3	0.1	0.43	2.2

Excess Lifetime Risk [ ]			
Diet 1	1.7E-07	7.0E-06	2.3E-04
Diet 2	6.2E-08	2.4E-06	8.2E-05
Diet 3	2.5E-08	8.8E-07	2.7E-05
Diet 4	4.3E-07	1.7E-05	6.1E-04

Relative Risk [ ]			
Diet 1	1.00026	1.0049	1.12
Diet 2	1.000089	1.0017	1.041
Diet 3	1.000032	1.00057	1.013
Diet 4	1.00053	1.013	1.31

Probability of Causation [%]			
Diet 1	0.026	0.486	10.95
Diet 2	0.009	0.174	3.96
Diet 3	0.003	0.057	1.31
Diet 4	0.053	1.291	23.31

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.32	1.6	8.5
Commercial Milk (locally produced)	0.06	0.37	2.4
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.00079	0.013	0.23
Leafy Vegetables (locally produced)	0.00037	0.0035	0.027
Eggs (locally produced)	0.021	0.14	0.85
Cottage Cheese (locally produced)	0.00065	0.0076	0.085
Inhalation	0.016	0.055	0.2
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.37	1.9	9.3
Diet 2	0.13	0.6	3.4
Diet 3	0.073	0.31	1.7

Excess Lifetime Risk [ ]			
Diet 1	9.6E-07	1.3E-05	2.1E-04
Diet 2	3.8E-07	4.9E-06	7.0E-05
Diet 3	2.0E-07	2.5E-06	3.1E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.00039	1.0037	1.038
Diet 2	1.00015	1.0013	1.017
Diet 3	1.000088	1.00071	1.0084
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.039	0.366	3.67
Diet 2	0.016	0.134	1.67
Diet 3	0.009	0.071	0.83
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.38	2	9.6
Commercial Milk (locally produced)	0.076	0.43	2.9
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0012	0.021	0.41
Leafy Vegetables (locally produced)	0.00037	0.0034	0.026
Eggs (locally produced)	0.021	0.15	0.9
Cottage Cheese (locally produced)	0.00067	0.0076	0.076
Inhalation	0.02	0.065	0.24
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.45	2.2	11
Diet 2	0.16	0.71	4
Diet 3	0.085	0.38	2.1

Excess Lifetime Risk [ ]			
Diet 1	8.8E-08	4.4E-06	1.2E-04
Diet 2	2.9E-08	1.5E-06	4.3E-05
Diet 3	2.1E-08	8.3E-07	2.6E-05
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.00015	1.0029	1.059
Diet 2	1.000053	1.0011	1.025
Diet 3	1.000029	1.00054	1.012
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.015	0.293	5.58
Diet 2	0.005	0.106	2.44
Diet 3	0.003	0.054	1.21
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.35	2.1	12
Commercial Milk (locally produced)	0.079	0.47	2.9
Commercial Milk (regionally mixed)	0.042	0.25	1.5
Goat Milk (locally produced)	0.75	5.5	38
Beef (locally produced)	0.001	0.017	0.35
Leafy Vegetables (locally produced)	0.00043	0.0043	0.04
Eggs (locally produced)	0.025	0.17	1.1
Cottage Cheese (locally produced)	0.00095	0.0098	0.11
Inhalation	0.022	0.071	0.25
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.43	2.4	13
Diet 2	0.16	0.79	4.4
Diet 3	0.076	0.33	1.7

Excess Lifetime Risk [ ]			
Diet 1	1.2E-06	1.7E-05	2.4E-04
Diet 2	4.4E-07	6.2E-06	8.1E-05
Diet 3	2.1E-07	2.7E-06	3.2E-05
Diet 4	3.1E-06	4.2E-05	6.4E-04

Relative Risk [ ]			
Diet 1	1.00052	1.0048	1.052
Diet 2	1.0002	1.0017	1.021
Diet 3	1.000094	1.00073	1.0085
Diet 4	1.0013	1.011	1.16

Probability of Causation [%]			
Diet 1	0.052	0.479	4.95
Diet 2	0.020	0.172	2.09
Diet 3	0.009	0.073	0.84
Diet 4	0.126	1.130	14.08

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.45	2.5	14
Commercial Milk (locally produced)	0.1	0.58	3.7
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.97	7.3	45
Beef (locally produced)	0.0016	0.026	0.57
Leafy Vegetables (locally produced)	0.0004	0.0042	0.038
Eggs (locally produced)	0.027	0.18	1.2
Cottage Cheese (locally produced)	0.00086	0.01	0.1
Inhalation	0.024	0.086	0.3
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.53	2.9	15
Diet 2	0.2	0.96	5.7
Diet 3	0.093	0.41	2.1

Excess Lifetime Risk [ ]			
Diet 1	1.2E-07	5.5E-06	1.7E-04
Diet 2	4.6E-08	2.0E-06	6.1E-05
Diet 3	2.4E-08	8.5E-07	2.6E-05
Diet 4	3.4E-07	1.3E-05	4.5E-04

Relative Risk [ ]			
Diet 1	1.00018	1.0039	1.089
Diet 2	1.00006	1.0014	1.033
Diet 3	1.00003	1.00057	1.013
Diet 4	1.00035	1.0099	1.29

Probability of Causation [%]			
Diet 1	0.018	0.387	8.19
Diet 2	0.006	0.136	3.15
Diet 3	0.003	0.057	1.27
Diet 4	0.035	0.981	22.22

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.51	2.8	16
Commercial Milk (locally produced)	0.11	0.65	3.6
Commercial Milk (regionally mixed)	0.042	0.25	1.5
Goat Milk (locally produced)	0.99	7.1	51
Beef (locally produced)	0.0013	0.022	0.47
Leafy Vegetables (locally produced)	0.00056	0.0059	0.05
Eggs (locally produced)	0.034	0.23	1.5
Cottage Cheese (locally produced)	0.0013	0.013	0.14
Inhalation	0.029	0.095	0.33
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.63	3.2	18
Diet 2	0.23	1.1	5.4
Diet 3	0.088	0.36	1.8

Excess Lifetime Risk [ ]			
Diet 1	1.6E-06	2.4E-05	3.3E-04
Diet 2	6.2E-07	8.5E-06	1.0E-04
Diet 3	2.4E-07	2.8E-06	3.3E-05
Diet 4	3.8E-06	5.6E-05	7.8E-04

Relative Risk [ ]			
Diet 1	1.00067	1.0063	1.067
Diet 2	1.00028	1.0024	1.028
Diet 3	1.00011	1.0008	1.0089
Diet 4	1.0018	1.016	1.22

Probability of Causation [%]			
Diet 1	0.067	0.631	6.32
Diet 2	0.028	0.243	2.69
Diet 3	0.011	0.080	0.88
Diet 4	0.177	1.551	18.08

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.67	3.4	17
Commercial Milk (locally produced)	0.14	0.79	4.3
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	1.3	9.7	62
Beef (locally produced)	0.0021	0.036	0.76
Leafy Vegetables (locally produced)	0.00053	0.0058	0.049
Eggs (locally produced)	0.037	0.25	1.6
Cottage Cheese (locally produced)	0.0012	0.013	0.13
Inhalation	0.033	0.12	0.39
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.79	3.9	19
Diet 2	0.27	1.3	6.8
Diet 3	0.1	0.44	2.2

Excess Lifetime Risk [ ]			
Diet 1	1.8E-07	7.6E-06	2.2E-04
Diet 2	6.3E-08	2.7E-06	8.4E-05
Diet 3	2.5E-08	8.9E-07	2.8E-05
Diet 4	4.7E-07	1.8E-05	6.3E-04

Relative Risk [ ]			
Diet 1	1.00026	1.0052	1.13
Diet 2	1.000089	1.0019	1.041
Diet 3	1.000033	1.0006	1.014
Diet 4	1.00052	1.014	1.32

Probability of Causation [%]			
Diet 1	0.026	0.516	11.49
Diet 2	0.009	0.185	3.96
Diet 3	0.003	0.060	1.34
Diet 4	0.052	1.364	24.04

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.29	1.5	8.8
Commercial Milk (locally produced)	0.054	0.36	2.3
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.54	4	29
Beef (locally produced)	0.00081	0.012	0.26
Leafy Vegetables (locally produced)	0.00032	0.0033	0.028
Eggs (locally produced)	0.019	0.13	0.8
Cottage Cheese (locally produced)	0.0007	0.0075	0.084
Inhalation	0.017	0.056	0.2
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.35	1.8	10
Diet 2	0.12	0.6	3.4
Diet 3	0.073	0.32	1.7

Excess Lifetime Risk [ ]			
Diet 1	9.3E-07	1.3E-05	1.9E-04
Diet 2	3.5E-07	4.9E-06	6.4E-05
Diet 3	2.0E-07	2.5E-06	3.1E-05
Diet 4	2.3E-06	3.3E-05	4.8E-04

Relative Risk [ ]			
Diet 1	1.00038	1.0035	1.039
Diet 2	1.00015	1.0013	1.016
Diet 3	1.000086	1.0007	1.0083
Diet 4	1.00091	1.0084	1.13

Probability of Causation [%]			
Diet 1	0.038	0.352	3.78
Diet 2	0.015	0.130	1.55
Diet 3	0.009	0.070	0.83
Diet 4	0.091	0.834	11.30

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.37	1.9	11
Commercial Milk (locally produced)	0.07	0.44	2.9
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.72	5.5	35
Beef (locally produced)	0.0012	0.02	0.4
Leafy Vegetables (locally produced)	0.0003	0.0032	0.029
Eggs (locally produced)	0.02	0.14	0.86
Cottage Cheese (locally produced)	0.00062	0.0074	0.076
Inhalation	0.02	0.069	0.24
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.44	2.2	12
Diet 2	0.15	0.74	4.1
Diet 3	0.086	0.38	2.1

Excess Lifetime Risk [ ]			
Diet 1	9.5E-08	4.2E-06	1.2E-04
Diet 2	3.7E-08	1.5E-06	4.7E-05
Diet 3	2.2E-08	8.0E-07	2.6E-05
Diet 4	2.7E-07	9.7E-06	3.6E-04

Relative Risk [ ]			
Diet 1	1.00014	1.003	1.072
Diet 2	1.000047	1.001	1.023
Diet 3	1.000028	1.00054	1.012
Diet 4	1.00026	1.0077	1.18

Probability of Causation [%]			
Diet 1	0.014	0.301	6.71
Diet 2	0.005	0.104	2.28
Diet 3	0.003	0.054	1.17
Diet 4	0.026	0.761	15.14

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.18	0.91	4.9
Commercial Milk (locally produced)	0.036	0.21	1.3
Commercial Milk (regionally mixed)	0.042	0.25	1.5
Goat Milk (locally produced)	0.31	2.3	17
Beef (locally produced)	0.00047	0.0076	0.14
Leafy Vegetables (locally produced)	0.00021	0.002	0.016
Eggs (locally produced)	0.012	0.078	0.49
Cottage Cheese (locally produced)	0.00038	0.0043	0.047
Inhalation	0.0093	0.031	0.11
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.21	1.1	5.4
Diet 2	0.075	0.35	2
Diet 3	0.059	0.28	1.6

Excess Lifetime Risk [ ]			
Diet 1	5.3E-07	7.5E-06	1.2E-04
Diet 2	2.1E-07	2.9E-06	3.9E-05
Diet 3	1.7E-07	2.3E-06	3.0E-05
Diet 4	1.4E-06	1.8E-05	3.0E-04

Relative Risk [ ]			
Diet 1	1.00021	1.0021	1.022
Diet 2	1.000089	1.00077	1.0098
Diet 3	1.000077	1.00066	1.008
Diet 4	1.00056	1.0049	1.069

Probability of Causation [%]			
Diet 1	0.021	0.212	2.18
Diet 2	0.009	0.077	0.97
Diet 3	0.008	0.066	0.79
Diet 4	0.056	0.492	6.42

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.22	1.1	5.7
Commercial Milk (locally produced)	0.044	0.25	1.7
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.43	3.2	21
Beef (locally produced)	0.0007	0.012	0.24
Leafy Vegetables (locally produced)	0.00022	0.002	0.015
Eggs (locally produced)	0.012	0.083	0.51
Cottage Cheese (locally produced)	0.00039	0.0043	0.042
Inhalation	0.011	0.036	0.13
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.25	1.3	6.4
Diet 2	0.09	0.41	2.4
Diet 3	0.072	0.34	2

Excess Lifetime Risk [ ]			
Diet 1	5.0E-08	2.5E-06	6.9E-05
Diet 2	1.7E-08	8.8E-07	2.6E-05
Diet 3	1.9E-08	7.5E-07	2.5E-05
Diet 4	1.6E-07	5.8E-06	1.9E-04

Relative Risk [ ]			
Diet 1	1.000088	1.0017	1.035
Diet 2	1.00003	1.00061	1.014
Diet 3	1.000026	1.0005	1.011
Diet 4	1.00018	1.0046	1.11

Probability of Causation [%]			
Diet 1	0.009	0.171	3.42
Diet 2	0.003	0.061	1.39
Diet 3	0.003	0.050	1.12
Diet 4	0.018	0.459	10.16

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.41	2.2	13
Commercial Milk (locally produced)	0.081	0.49	3.2
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.78	5.6	38
Beef (locally produced)	0.0011	0.018	0.4
Leafy Vegetables (locally produced)	0.00048	0.0047	0.038
Eggs (locally produced)	0.026	0.18	1.1
Cottage Cheese (locally produced)	0.001	0.01	0.12
Inhalation	0.023	0.078	0.27
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.5	2.5	14
Diet 2	0.18	0.84	4.5
Diet 3	0.081	0.34	1.7

Excess Lifetime Risk [ ]			
Diet 1	1.2E-06	1.8E-05	2.7E-04
Diet 2	5.0E-07	6.7E-06	8.7E-05
Diet 3	2.2E-07	2.6E-06	3.2E-05
Diet 4	3.1E-06	4.5E-05	6.3E-04

Relative Risk [ ]			
Diet 1	1.00053	1.0052	1.051
Diet 2	1.00021	1.0019	1.021
Diet 3	1.000094	1.00076	1.0085
Diet 4	1.0013	1.012	1.17

Probability of Causation [%]			
Diet 1	0.053	0.517	4.87
Diet 2	0.021	0.191	2.10
Diet 3	0.009	0.076	0.84
Diet 4	0.132	1.184	14.20

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.54	2.7	15
Commercial Milk (locally produced)	0.11	0.61	3.7
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	1	7.7	49
Beef (locally produced)	0.0016	0.028	0.61
Leafy Vegetables (locally produced)	0.00045	0.0046	0.04
Eggs (locally produced)	0.028	0.2	1.2
Cottage Cheese (locally produced)	0.00099	0.011	0.11
Inhalation	0.027	0.095	0.32
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.63	3.1	16
Diet 2	0.21	1	5.7
Diet 3	0.098	0.41	2.1

Excess Lifetime Risk [ ]			
Diet 1	1.3E-07	6.0E-06	1.8E-04
Diet 2	5.0E-08	2.2E-06	6.7E-05
Diet 3	2.3E-08	8.6E-07	2.6E-05
Diet 4	4.0E-07	1.4E-05	4.2E-04

Relative Risk [ ]			
Diet 1	1.0002	1.0041	1.1
Diet 2	1.000067	1.0015	1.03
Diet 3	1.000031	1.00057	1.013
Diet 4	1.00035	1.011	1.27

Probability of Causation [%]			
Diet 1	0.020	0.408	9.17
Diet 2	0.007	0.148	2.94
Diet 3	0.003	0.057	1.27
Diet 4	0.035	1.068	21.23

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.09	0.51	3.1
Commercial Milk (locally produced)	0.018	0.12	0.76
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.16	1.3	9.3
Beef (locally produced)	0.00027	0.0042	0.087
Leafy Vegetables (locally produced)	0.0001	0.0011	0.009
Eggs (locally produced)	0.0059	0.044	0.28
Cottage Cheese (locally produced)	0.00022	0.0025	0.029
Inhalation	0.0052	0.018	0.066
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.11	0.6	3.5
Diet 2	0.038	0.2	1.1
Diet 3	0.054	0.27	1.6

Excess Lifetime Risk [ ]			
Diet 1	2.7E-07	4.3E-06	6.3E-05
Diet 2	1.1E-07	1.6E-06	2.1E-05
Diet 3	1.6E-07	2.2E-06	3.0E-05
Diet 4	6.8E-07	1.1E-05	1.5E-04

Relative Risk [ ]			
Diet 1	1.00011	1.0012	1.013
Diet 2	1.000047	1.00044	1.0053
Diet 3	1.000072	1.00062	1.0077
Diet 4	1.00027	1.0028	1.042

Probability of Causation [%]			
Diet 1	0.011	0.123	1.25
Diet 2	0.005	0.044	0.53
Diet 3	0.007	0.062	0.77
Diet 4	0.027	0.279	3.98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.11	0.63	3.8
Commercial Milk (locally produced)	0.023	0.15	0.94
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.22	1.8	12
Beef (locally produced)	0.00041	0.0066	0.14
Leafy Vegetables (locally produced)	0.0001	0.0011	0.0094
Eggs (locally produced)	0.0061	0.047	0.31
Cottage Cheese (locally produced)	0.00022	0.0025	0.026
Inhalation	0.0061	0.022	0.077
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.13	0.73	4.3
Diet 2	0.048	0.24	1.3
Diet 3	0.065	0.32	2

Excess Lifetime Risk [ ]			
Diet 1	2.7E-08	1.4E-06	4.2E-05
Diet 2	1.1E-08	5.1E-07	1.7E-05
Diet 3	1.8E-08	7.0E-07	2.4E-05
Diet 4	8.8E-08	3.3E-06	1.2E-04

Relative Risk [ ]			
Diet 1	1.00005	1.00097	1.023
Diet 2	1.000016	1.00034	1.0079
Diet 3	1.000023	1.00047	1.011
Diet 4	1.000091	1.0026	1.067

Probability of Causation [%]			
Diet 1	0.005	0.097	2.28
Diet 2	0.002	0.034	0.79
Diet 3	0.002	0.047	1.09
Diet 4	0.009	0.254	6.21

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.35	1.8	11
Commercial Milk (locally produced)	0.068	0.41	2.6
Commercial Milk (regionally mixed)	0.042	0.25	1.5
Goat Milk (locally produced)	0.68	4.7	32
Beef (locally produced)	0.00091	0.015	0.32
Leafy Vegetables (locally produced)	0.00039	0.0039	0.032
Eggs (locally produced)	0.022	0.15	0.94
Cottage Cheese (locally produced)	0.00085	0.0086	0.098
Inhalation	0.02	0.064	0.22
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.42	2.1	12
Diet 2	0.15	0.7	3.8
Diet 3	0.075	0.32	1.7

Excess Lifetime Risk [ ]			
Diet 1	1.1E-06	1.5E-05	2.2E-04
Diet 2	4.3E-07	5.7E-06	7.2E-05
Diet 3	2.1E-07	2.6E-06	3.2E-05
Diet 4	2.7E-06	3.8E-05	5.1E-04

Relative Risk [ ]			
Diet 1	1.00043	1.0043	1.043
Diet 2	1.00018	1.0016	1.018
Diet 3	1.000089	1.00073	1.0083
Diet 4	1.0011	1.0098	1.13

Probability of Causation [%]			
Diet 1	0.043	0.432	4.11
Diet 2	0.018	0.159	1.78
Diet 3	0.009	0.073	0.82
Diet 4	0.114	0.975	11.67

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.45	2.2	12
Commercial Milk (locally produced)	0.092	0.51	3.1
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.9	6.4	40
Beef (locally produced)	0.0014	0.024	0.5
Leafy Vegetables (locally produced)	0.00038	0.0038	0.034
Eggs (locally produced)	0.023	0.16	0.99
Cottage Cheese (locally produced)	0.00084	0.0088	0.091
Inhalation	0.023	0.079	0.26
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.53	2.6	14
Diet 2	0.18	0.85	4.8
Diet 3	0.092	0.39	2.1

Excess Lifetime Risk [ ]			
Diet 1	1.1E-07	5.0E-06	1.5E-04
Diet 2	4.2E-08	1.8E-06	5.6E-05
Diet 3	2.2E-08	8.3E-07	2.6E-05
Diet 4	3.2E-07	1.2E-05	3.6E-04

Relative Risk [ ]			
Diet 1	1.00017	1.0035	1.083
Diet 2	1.000056	1.0012	1.026
Diet 3	1.000029	1.00055	1.012
Diet 4	1.0003	1.0091	1.23

Probability of Causation [%]			
Diet 1	0.017	0.345	7.68
Diet 2	0.006	0.122	2.54
Diet 3	0.003	0.055	1.23
Diet 4	0.030	0.897	18.34

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.16	0.89	4.6
Commercial Milk (locally produced)	0.033	0.2	1.3
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.28	2.2	17
Beef (locally produced)	0.00043	0.0073	0.13
Leafy Vegetables (locally produced)	0.00019	0.0019	0.015
Eggs (locally produced)	0.011	0.075	0.46
Cottage Cheese (locally produced)	0.00038	0.0042	0.044
Inhalation	0.0092	0.031	0.11
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.19	1	5.2
Diet 2	0.071	0.34	1.8
Diet 3	0.058	0.29	1.6

Excess Lifetime Risk [ ]			
Diet 1	5.0E-07	7.2E-06	1.1E-04
Diet 2	2.1E-07	2.7E-06	3.7E-05
Diet 3	1.7E-07	2.3E-06	3.0E-05
Diet 4	1.2E-06	1.7E-05	2.8E-04

Relative Risk [ ]			
Diet 1	1.00022	1.002	1.022
Diet 2	1.000087	1.00076	1.0089
Diet 3	1.000078	1.00066	1.008
Diet 4	1.00053	1.005	1.067

Probability of Causation [%]			
Diet 1	0.022	0.203	2.14
Diet 2	0.009	0.076	0.88
Diet 3	0.008	0.066	0.79
Diet 4	0.053	0.499	6.28

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.2	1.1	5.4
Commercial Milk (locally produced)	0.043	0.24	1.5
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.38	3.1	20
Beef (locally produced)	0.00065	0.011	0.22
Leafy Vegetables (locally produced)	0.00019	0.0018	0.015
Eggs (locally produced)	0.012	0.079	0.5
Cottage Cheese (locally produced)	0.00038	0.0042	0.039
Inhalation	0.011	0.037	0.13
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.24	1.2	6.2
Diet 2	0.084	0.4	2.2
Diet 3	0.071	0.34	2

Excess Lifetime Risk [ ]			
Diet 1	5.3E-08	2.5E-06	6.4E-05
Diet 2	1.8E-08	8.7E-07	2.5E-05
Diet 3	1.9E-08	7.5E-07	2.5E-05
Diet 4	1.5E-07	5.6E-06	1.9E-04

Relative Risk [ ]			
Diet 1	1.000083	1.0016	1.037
Diet 2	1.000028	1.00059	1.013
Diet 3	1.000025	1.00048	1.011
Diet 4	1.00017	1.0044	1.098

Probability of Causation [%]			
Diet 1	0.008	0.164	3.55
Diet 2	0.003	0.059	1.29
Diet 3	0.002	0.048	1.13
Diet 4	0.017	0.437	8.86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.26	1.4	8.2
Commercial Milk (locally produced)	0.054	0.32	2
Commercial Milk (regionally mixed)	0.042	0.25	1.5
Goat Milk (locally produced)	0.46	3.6	25
Beef (locally produced)	0.0007	0.011	0.24
Leafy Vegetables (locally produced)	0.0003	0.003	0.024
Eggs (locally produced)	0.018	0.12	0.71
Cottage Cheese (locally produced)	0.00064	0.0069	0.075
Inhalation	0.015	0.05	0.17
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.32	1.7	9.2
Diet 2	0.11	0.55	3
Diet 3	0.069	0.31	1.7

Excess Lifetime Risk [ ]			
Diet 1	7.6E-07	1.2E-05	1.7E-04
Diet 2	3.1E-07	4.3E-06	5.6E-05
Diet 3	1.9E-07	2.4E-06	3.1E-05
Diet 4	1.9E-06	2.9E-05	4.1E-04

Relative Risk [ ]			
Diet 1	1.00033	1.0033	1.034
Diet 2	1.00013	1.0012	1.013
Diet 3	1.000082	1.0007	1.0081
Diet 4	1.00088	1.0076	1.11

Probability of Causation [%]			
Diet 1	0.033	0.328	3.29
Diet 2	0.013	0.123	1.31
Diet 3	0.008	0.070	0.81
Diet 4	0.088	0.756	10.04

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**  
**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.34	1.7	9.6
Commercial Milk (locally produced)	0.071	0.39	2.4
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.67	4.9	32
Beef (locally produced)	0.0011	0.018	0.38
Leafy Vegetables (locally produced)	0.00029	0.003	0.024
Eggs (locally produced)	0.019	0.13	0.78
Cottage Cheese (locally produced)	0.00064	0.0069	0.068
Inhalation	0.018	0.059	0.2
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.39	2	11
Diet 2	0.14	0.66	3.6
Diet 3	0.084	0.37	2.1

Excess Lifetime Risk [ ]			
Diet 1	8.5E-08	3.9E-06	1.1E-04
Diet 2	3.1E-08	1.4E-06	4.5E-05
Diet 3	2.1E-08	8.0E-07	2.5E-05
Diet 4	2.4E-07	8.9E-06	3.1E-04

Relative Risk [ ]			
Diet 1	1.00013	1.0026	1.061
Diet 2	1.000044	1.00092	1.02
Diet 3	1.000027	1.00053	1.012
Diet 4	1.00022	1.0069	1.17

Probability of Causation [%]			
Diet 1	0.013	0.260	5.76
Diet 2	0.004	0.092	1.91
Diet 3	0.003	0.053	1.17
Diet 4	0.022	0.685	14.75

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.14	0.8	4.5
Commercial Milk (locally produced)	0.029	0.19	1.1
Commercial Milk (regionally mixed)	0.042	0.25	1.5
Goat Milk (locally produced)	0.29	2	15
Beef (locally produced)	0.00041	0.0064	0.14
Leafy Vegetables (locally produced)	0.00016	0.0017	0.015
Eggs (locally produced)	0.0095	0.065	0.45
Cottage Cheese (locally produced)	0.00035	0.0038	0.039
Inhalation	0.0096	0.034	0.13
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.17	0.94	5.1
Diet 2	0.063	0.32	1.6
Diet 3	0.059	0.29	1.6

Excess Lifetime Risk [ ]			
Diet 1	5.1E-07	6.9E-06	1.0E-04
Diet 2	1.9E-07	2.5E-06	3.1E-05
Diet 3	1.8E-07	2.3E-06	3.0E-05
Diet 4	1.1E-06	1.7E-05	2.5E-04

Relative Risk [ ]			
Diet 1	1.0002	1.0019	1.02
Diet 2	1.00008	1.00071	1.0082
Diet 3	1.000077	1.00066	1.008
Diet 4	1.00051	1.0046	1.065

Probability of Causation [%]			
Diet 1	0.020	0.189	1.95
Diet 2	0.008	0.071	0.81
Diet 3	0.008	0.066	0.79
Diet 4	0.051	0.459	6.12

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.18	0.96	5.3
Commercial Milk (locally produced)	0.038	0.23	1.4
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.37	2.8	20
Beef (locally produced)	0.00061	0.01	0.24
Leafy Vegetables (locally produced)	0.00015	0.0017	0.014
Eggs (locally produced)	0.011	0.073	0.52
Cottage Cheese (locally produced)	0.00035	0.0038	0.036
Inhalation	0.011	0.041	0.14
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.22	1.1	5.9
Diet 2	0.074	0.38	2
Diet 3	0.074	0.35	2.1

Excess Lifetime Risk [ ]			
Diet 1	4.9E-08	2.3E-06	7.1E-05
Diet 2	2.0E-08	8.0E-07	2.5E-05
Diet 3	1.9E-08	7.6E-07	2.5E-05
Diet 4	1.3E-07	5.3E-06	1.9E-04

Relative Risk [ ]			
Diet 1	1.000076	1.0015	1.037
Diet 2	1.000027	1.00056	1.012
Diet 3	1.000025	1.00049	1.011
Diet 4	1.00016	1.004	1.094

Probability of Causation [%]			
Diet 1	0.008	0.154	3.56
Diet 2	0.003	0.056	1.20
Diet 3	0.002	0.049	1.13
Diet 4	0.016	0.399	8.56

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.034	0.22	1.3
Commercial Milk (locally produced)	0.0076	0.051	0.34
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.075	0.59	4.2
Beef (locally produced)	0.00012	0.0018	0.042
Leafy Vegetables (locally produced)	0.000041	0.00047	0.0046
Eggs (locally produced)	0.0023	0.018	0.12
Cottage Cheese (locally produced)	0.000091	0.0011	0.011
Inhalation	0.0022	0.008	0.033
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.043	0.26	1.4
Diet 2	0.015	0.086	0.51
Diet 3	0.047	0.26	1.6

Excess Lifetime Risk [ ]			
Diet 1	1.1E-07	1.8E-06	3.0E-05
Diet 2	5.0E-08	6.8E-07	1.0E-05
Diet 3	1.5E-07	2.1E-06	2.9E-05
Diet 4	3.0E-07	4.6E-06	8.2E-05

Relative Risk [ ]			
Diet 1	1.000052	1.00051	1.0066
Diet 2	1.00002	1.00019	1.0027
Diet 3	1.000066	1.00061	1.0076
Diet 4	1.00012	1.0012	1.019

Probability of Causation [%]			
Diet 1	0.005	0.051	0.66
Diet 2	0.002	0.019	0.27
Diet 3	0.007	0.060	0.75
Diet 4	0.012	0.122	1.88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**  
**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.044	0.27	1.5
Commercial Milk (locally produced)	0.0095	0.062	0.44
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.1	0.78	5.5
Beef (locally produced)	0.00018	0.0028	0.068
Leafy Vegetables (locally produced)	0.000042	0.00046	0.0043
Eggs (locally produced)	0.0025	0.02	0.13
Cottage Cheese (locally produced)	0.000088	0.0011	0.011
Inhalation	0.0025	0.0097	0.038
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.052	0.31	1.7
Diet 2	0.018	0.1	0.65
Diet 3	0.06	0.31	2

Excess Lifetime Risk [ ]			
Diet 1	1.2E-08	6.0E-07	1.9E-05
Diet 2	4.8E-09	2.2E-07	6.4E-06
Diet 3	1.7E-08	6.7E-07	2.4E-05
Diet 4	3.5E-08	1.4E-06	5.4E-05

Relative Risk [ ]			
Diet 1	1.000018	1.00042	1.0099
Diet 2	1.000006	1.00015	1.0036
Diet 3	1.000021	1.00046	1.011
Diet 4	1.000037	1.0011	1.03

Probability of Causation [%]			
Diet 1	0.002	0.042	0.98
Diet 2	0.001	0.015	0.36
Diet 3	0.002	0.046	1.07
Diet 4	0.004	0.106	2.88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.17	0.9	5.4
Commercial Milk (locally produced)	0.035	0.21	1.4
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.34	2.3	17
Beef (locally produced)	0.00048	0.0074	0.17
Leafy Vegetables (locally produced)	0.00019	0.002	0.017
Eggs (locally produced)	0.011	0.077	0.47
Cottage Cheese (locally produced)	0.00041	0.0044	0.046
Inhalation	0.01	0.035	0.12
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.21	1.1	6
Diet 2	0.075	0.36	2.1
Diet 3	0.063	0.29	1.6

Excess Lifetime Risk [ ]			
Diet 1	5.1E-07	7.8E-06	1.2E-04
Diet 2	2.1E-07	2.9E-06	3.5E-05
Diet 3	1.8E-07	2.3E-06	3.0E-05
Diet 4	1.3E-06	1.9E-05	2.8E-04

Relative Risk [ ]			
Diet 1	1.00023	1.0022	1.023
Diet 2	1.000096	1.00077	1.0091
Diet 3	1.00008	1.00066	1.0079
Diet 4	1.00054	1.0051	1.073

Probability of Causation [%]			
Diet 1	0.023	0.216	2.23
Diet 2	0.010	0.077	0.91
Diet 3	0.008	0.066	0.79
Diet 4	0.054	0.502	6.80

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.21	1.1	6.4
Commercial Milk (locally produced)	0.046	0.26	1.6
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.43	3.3	21
Beef (locally produced)	0.00073	0.012	0.26
Leafy Vegetables (locally produced)	0.00019	0.0019	0.017
Eggs (locally produced)	0.012	0.083	0.53
Cottage Cheese (locally produced)	0.0004	0.0044	0.044
Inhalation	0.012	0.043	0.15
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.25	1.3	7.2
Diet 2	0.092	0.43	2.4
Diet 3	0.074	0.35	2

Excess Lifetime Risk [ ]			
Diet 1	5.9E-08	2.4E-06	7.3E-05
Diet 2	2.3E-08	8.5E-07	2.8E-05
Diet 3	2.0E-08	7.5E-07	2.5E-05
Diet 4	1.6E-07	5.6E-06	2.0E-04

Relative Risk [ ]			
Diet 1	1.000082	1.0017	1.042
Diet 2	1.00003	1.00062	1.014
Diet 3	1.000025	1.0005	1.011
Diet 4	1.00015	1.0045	1.11

Probability of Causation [%]			
Diet 1	0.008	0.172	4.02
Diet 2	0.003	0.062	1.41
Diet 3	0.002	0.050	1.13
Diet 4	0.015	0.444	9.94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.15	0.85	4.5
Commercial Milk (locally produced)	0.032	0.2	1.2
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.28	2.2	16
Beef (locally produced)	0.00044	0.0068	0.14
Leafy Vegetables (locally produced)	0.00019	0.0018	0.016
Eggs (locally produced)	0.01	0.071	0.45
Cottage Cheese (locally produced)	0.00037	0.0041	0.042
Inhalation	0.01	0.035	0.13
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.18	0.99	5.1
Diet 2	0.068	0.33	1.8
Diet 3	0.061	0.29	1.6

Excess Lifetime Risk [ ]			
Diet 1	5.0E-07	7.0E-06	1.0E-04
Diet 2	2.1E-07	2.6E-06	3.6E-05
Diet 3	1.7E-07	2.3E-06	3.0E-05
Diet 4	1.2E-06	1.7E-05	2.9E-04

Relative Risk [ ]			
Diet 1	1.00022	1.002	1.022
Diet 2	1.000087	1.00073	1.0089
Diet 3	1.000079	1.00067	1.008
Diet 4	1.00051	1.0048	1.068

Probability of Causation [%]			
Diet 1	0.022	0.199	2.15
Diet 2	0.009	0.073	0.88
Diet 3	0.008	0.067	0.80
Diet 4	0.051	0.480	6.33

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.18	1	5.2
Commercial Milk (locally produced)	0.041	0.24	1.5
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.38	2.9	20
Beef (locally produced)	0.00067	0.011	0.22
Leafy Vegetables (locally produced)	0.00018	0.0018	0.015
Eggs (locally produced)	0.011	0.076	0.48
Cottage Cheese (locally produced)	0.00036	0.004	0.038
Inhalation	0.012	0.042	0.15
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.22	1.2	5.9
Diet 2	0.083	0.4	2.2
Diet 3	0.073	0.35	2

Excess Lifetime Risk [ ]			
Diet 1	5.2E-08	2.3E-06	6.5E-05
Diet 2	1.9E-08	8.5E-07	2.4E-05
Diet 3	1.9E-08	7.5E-07	2.5E-05
Diet 4	1.4E-07	5.5E-06	1.9E-04

Relative Risk [ ]			
Diet 1	1.000072	1.0016	1.035
Diet 2	1.000026	1.00058	1.013
Diet 3	1.000025	1.0005	1.012
Diet 4	1.00015	1.0042	1.1

Probability of Causation [%]			
Diet 1	0.007	0.162	3.39
Diet 2	0.003	0.058	1.30
Diet 3	0.003	0.050	1.15
Diet 4	0.015	0.416	9.17

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.17	0.94	5.4
Commercial Milk (locally produced)	0.036	0.22	1.3
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.33	2.5	18
Beef (locally produced)	0.00051	0.0078	0.16
Leafy Vegetables (locally produced)	0.0002	0.002	0.018
Eggs (locally produced)	0.011	0.081	0.51
Cottage Cheese (locally produced)	0.0004	0.0046	0.05
Inhalation	0.012	0.041	0.15
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.21	1.1	6.1
Diet 2	0.078	0.38	2.1
Diet 3	0.063	0.3	1.6

Excess Lifetime Risk [ ]			
Diet 1	5.7E-07	8.4E-06	1.2E-04
Diet 2	2.2E-07	3.0E-06	4.0E-05
Diet 3	1.8E-07	2.4E-06	3.0E-05
Diet 4	1.5E-06	2.0E-05	3.1E-04

Relative Risk [ ]			
Diet 1	1.00024	1.0023	1.024
Diet 2	1.000096	1.00082	1.0098
Diet 3	1.00008	1.00068	1.0081
Diet 4	1.00056	1.0054	1.081

Probability of Causation [%]			
Diet 1	0.024	0.225	2.33
Diet 2	0.010	0.082	0.97
Diet 3	0.008	0.068	0.80
Diet 4	0.056	0.536	7.50

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.22	1.2	6.5
Commercial Milk (locally produced)	0.046	0.27	1.7
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.45	3.4	21
Beef (locally produced)	0.00076	0.012	0.25
Leafy Vegetables (locally produced)	0.00019	0.002	0.017
Eggs (locally produced)	0.012	0.088	0.55
Cottage Cheese (locally produced)	0.0004	0.0047	0.045
Inhalation	0.014	0.049	0.18
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.27	1.4	7.3
Diet 2	0.098	0.46	2.6
Diet 3	0.076	0.36	2.1

Excess Lifetime Risk [ ]			
Diet 1	6.1E-08	2.6E-06	7.6E-05
Diet 2	2.3E-08	9.4E-07	2.8E-05
Diet 3	2.0E-08	7.6E-07	2.5E-05
Diet 4	1.7E-07	6.2E-06	2.1E-04

Relative Risk [ ]			
Diet 1	1.000086	1.0019	1.045
Diet 2	1.000031	1.00066	1.015
Diet 3	1.000026	1.00052	1.012
Diet 4	1.00017	1.0046	1.13

Probability of Causation [%]			
Diet 1	0.009	0.192	4.26
Diet 2	0.003	0.066	1.48
Diet 3	0.003	0.052	1.15
Diet 4	0.017	0.459	11.69

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.099	0.51	3.2
Commercial Milk (locally produced)	0.018	0.12	0.83
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.18	1.4	10
Beef (locally produced)	0.00029	0.0044	0.087
Leafy Vegetables (locally produced)	0.00011	0.0011	0.01
Eggs (locally produced)	0.0064	0.044	0.3
Cottage Cheese (locally produced)	0.00026	0.0025	0.028
Inhalation	0.0069	0.023	0.087
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.12	0.6	3.6
Diet 2	0.043	0.21	1.2
Diet 3	0.057	0.28	1.6

Excess Lifetime Risk [ ]			
Diet 1	3.2E-07	4.4E-06	7.1E-05
Diet 2	1.4E-07	1.7E-06	2.4E-05
Diet 3	1.7E-07	2.2E-06	3.0E-05
Diet 4	7.9E-07	1.0E-05	1.8E-04

Relative Risk [ ]			
Diet 1	1.00013	1.0012	1.014
Diet 2	1.000053	1.00045	1.0058
Diet 3	1.000075	1.00064	1.0079
Diet 4	1.00029	1.0029	1.046

Probability of Causation [%]			
Diet 1	0.013	0.122	1.42
Diet 2	0.005	0.045	0.58
Diet 3	0.007	0.064	0.78
Diet 4	0.029	0.288	4.35

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.12	0.64	3.8
Commercial Milk (locally produced)	0.024	0.15	1
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.22	1.8	13
Beef (locally produced)	0.00042	0.007	0.14
Leafy Vegetables (locally produced)	0.00011	0.0011	0.011
Eggs (locally produced)	0.0068	0.047	0.31
Cottage Cheese (locally produced)	0.0002	0.0025	0.027
Inhalation	0.0085	0.028	0.11
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.15	0.75	4.3
Diet 2	0.052	0.25	1.5
Diet 3	0.069	0.33	2

Excess Lifetime Risk [ ]			
Diet 1	3.2E-08	1.4E-06	3.9E-05
Diet 2	1.2E-08	5.1E-07	1.7E-05
Diet 3	1.9E-08	7.2E-07	2.4E-05
Diet 4	9.3E-08	3.3E-06	1.2E-04

Relative Risk [ ]			
Diet 1	1.000041	1.001	1.025
Diet 2	1.000015	1.00039	1.0088
Diet 3	1.000024	1.00048	1.011
Diet 4	1.00009	1.0026	1.058

Probability of Causation [%]			
Diet 1	0.004	0.105	2.44
Diet 2	0.002	0.039	0.88
Diet 3	0.002	0.048	1.10
Diet 4	0.009	0.264	5.49

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.16	0.81	4.6
Commercial Milk (locally produced)	0.03	0.19	1.2
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.29	2.1	15
Beef (locally produced)	0.00043	0.0068	0.14
Leafy Vegetables (locally produced)	0.00017	0.0018	0.015
Eggs (locally produced)	0.01	0.069	0.42
Cottage Cheese (locally produced)	0.00038	0.004	0.043
Inhalation	0.011	0.035	0.12
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.2	0.95	5.2
Diet 2	0.068	0.33	1.7
Diet 3	0.062	0.29	1.6

Excess Lifetime Risk [ ]			
Diet 1	5.0E-07	7.0E-06	9.5E-05
Diet 2	2.1E-07	2.7E-06	3.4E-05
Diet 3	1.8E-07	2.3E-06	3.1E-05
Diet 4	1.2E-06	1.7E-05	2.4E-04

Relative Risk [ ]			
Diet 1	1.0002	1.002	1.02
Diet 2	1.000084	1.00072	1.0082
Diet 3	1.000078	1.00067	1.008
Diet 4	1.00053	1.0045	1.063

Probability of Causation [%]			
Diet 1	0.020	0.196	1.99
Diet 2	0.008	0.072	0.81
Diet 3	0.008	0.067	0.79
Diet 4	0.053	0.444	5.91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**  
**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.2	1	5.5
Commercial Milk (locally produced)	0.04	0.23	1.4
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.39	2.9	19
Beef (locally produced)	0.00066	0.011	0.22
Leafy Vegetables (locally produced)	0.00018	0.0017	0.015
Eggs (locally produced)	0.011	0.075	0.45
Cottage Cheese (locally produced)	0.00035	0.004	0.039
Inhalation	0.013	0.042	0.15
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.24	1.2	6.3
Diet 2	0.089	0.4	2.1
Diet 3	0.077	0.35	2.1

Excess Lifetime Risk [ ]			
Diet 1	5.1E-08	2.3E-06	6.5E-05
Diet 2	1.9E-08	8.3E-07	2.7E-05
Diet 3	2.0E-08	7.6E-07	2.5E-05
Diet 4	1.4E-07	5.2E-06	1.9E-04

Relative Risk [ ]			
Diet 1	1.000077	1.0016	1.037
Diet 2	1.000026	1.00058	1.013
Diet 3	1.000026	1.0005	1.011
Diet 4	1.00014	1.0041	1.1

Probability of Causation [%]			
Diet 1	0.008	0.159	3.56
Diet 2	0.003	0.058	1.31
Diet 3	0.003	0.050	1.13
Diet 4	0.014	0.409	9.41

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.098	0.5	2.7
Commercial Milk (locally produced)	0.019	0.12	0.71
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.2	1.3	9.1
Beef (locally produced)	0.00026	0.0042	0.096
Leafy Vegetables (locally produced)	0.00011	0.0011	0.0093
Eggs (locally produced)	0.0057	0.042	0.26
Cottage Cheese (locally produced)	0.00024	0.0024	0.026
Inhalation	0.0055	0.019	0.07
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.12	0.58	3.1
Diet 2	0.041	0.2	1.1
Diet 3	0.053	0.27	1.6

Excess Lifetime Risk [ ]			
Diet 1	3.1E-07	4.1E-06	6.5E-05
Diet 2	1.2E-07	1.6E-06	2.1E-05
Diet 3	1.6E-07	2.2E-06	3.0E-05
Diet 4	7.5E-07	1.1E-05	1.6E-04

Relative Risk [ ]			
Diet 1	1.00013	1.0012	1.013
Diet 2	1.00005	1.00044	1.0054
Diet 3	1.000072	1.00063	1.0077
Diet 4	1.0003	1.0028	1.038

Probability of Causation [%]			
Diet 1	0.013	0.120	1.24
Diet 2	0.005	0.044	0.54
Diet 3	0.007	0.063	0.77
Diet 4	0.030	0.283	3.67

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**  
**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.12	0.61	3.1
Commercial Milk (locally produced)	0.026	0.14	0.93
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.25	1.8	11
Beef (locally produced)	0.00039	0.0067	0.15
Leafy Vegetables (locally produced)	0.0001	0.0011	0.0093
Eggs (locally produced)	0.0063	0.045	0.27
Cottage Cheese (locally produced)	0.00024	0.0024	0.025
Inhalation	0.0067	0.023	0.081
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.14	0.7	3.5
Diet 2	0.051	0.23	1.3
Diet 3	0.066	0.33	2

Excess Lifetime Risk [ ]			
Diet 1	3.0E-08	1.4E-06	4.4E-05
Diet 2	1.3E-08	5.2E-07	1.6E-05
Diet 3	1.8E-08	7.1E-07	2.4E-05
Diet 4	8.9E-08	3.3E-06	1.1E-04

Relative Risk [ ]			
Diet 1	1.000043	1.00093	1.022
Diet 2	1.000015	1.00035	1.0076
Diet 3	1.000022	1.00047	1.011
Diet 4	1.000093	1.0025	1.061

Probability of Causation [%]			
Diet 1	0.004	0.093	2.11
Diet 2	0.001	0.035	0.76
Diet 3	0.002	0.047	1.10
Diet 4	0.009	0.248	5.74

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.098	0.63	3.2
Commercial Milk (locally produced)	0.024	0.15	0.91
Commercial Milk (regionally mixed)	0.042	0.25	1.5
Goat Milk (locally produced)	0.18	1.5	12
Beef (locally produced)	0.00032	0.005	0.091
Leafy Vegetables (locally produced)	0.00014	0.0013	0.012
Eggs (locally produced)	0.0076	0.051	0.33
Cottage Cheese (locally produced)	0.00027	0.003	0.03
Inhalation	0.0079	0.027	0.098
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.12	0.74	3.7
Diet 2	0.051	0.25	1.3
Diet 3	0.056	0.28	1.6

Excess Lifetime Risk [ ]			
Diet 1	3.7E-07	5.1E-06	7.5E-05
Diet 2	1.6E-07	1.9E-06	2.5E-05
Diet 3	1.7E-07	2.3E-06	3.0E-05
Diet 4	8.3E-07	1.2E-05	2.2E-04

Relative Risk [ ]			
Diet 1	1.00016	1.0015	1.016
Diet 2	1.000066	1.00054	1.0065
Diet 3	1.000077	1.00066	1.0079
Diet 4	1.00038	1.0036	1.048

Probability of Causation [%]			
Diet 1	0.016	0.147	1.62
Diet 2	0.007	0.054	0.65
Diet 3	0.008	0.066	0.79
Diet 4	0.038	0.360	4.56

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.13	0.77	3.8
Commercial Milk (locally produced)	0.029	0.18	1.1
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.24	2.1	15
Beef (locally produced)	0.00048	0.0081	0.15
Leafy Vegetables (locally produced)	0.00014	0.0013	0.011
Eggs (locally produced)	0.0083	0.056	0.37
Cottage Cheese (locally produced)	0.00026	0.003	0.027
Inhalation	0.0093	0.034	0.12
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.16	0.9	4.5
Diet 2	0.06	0.29	1.6
Diet 3	0.069	0.34	2

Excess Lifetime Risk [ ]			
Diet 1	4.1E-08	1.8E-06	4.6E-05
Diet 2	1.5E-08	6.3E-07	1.8E-05
Diet 3	1.8E-08	7.4E-07	2.5E-05
Diet 4	1.0E-07	4.0E-06	1.4E-04

Relative Risk [ ]			
Diet 1	1.000057	1.0012	1.027
Diet 2	1.000021	1.00043	1.0093
Diet 3	1.000024	1.00048	1.011
Diet 4	1.0001	1.0032	1.065

Probability of Causation [%]			
Diet 1	0.006	0.122	2.62
Diet 2	0.002	0.043	0.92
Diet 3	0.002	0.048	1.12
Diet 4	0.010	0.314	6.07

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.19	1	5.7
Commercial Milk (locally produced)	0.04	0.24	1.5
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.38	2.7	19
Beef (locally produced)	0.00054	0.0085	0.17
Leafy Vegetables (locally produced)	0.00023	0.0022	0.019
Eggs (locally produced)	0.013	0.088	0.55
Cottage Cheese (locally produced)	0.00049	0.0051	0.052
Inhalation	0.013	0.043	0.16
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.23	1.2	6.6
Diet 2	0.085	0.42	2.2
Diet 3	0.066	0.3	1.7

Excess Lifetime Risk [ ]			
Diet 1	5.9E-07	8.7E-06	1.2E-04
Diet 2	2.4E-07	3.3E-06	4.3E-05
Diet 3	1.9E-07	2.4E-06	3.1E-05
Diet 4	1.4E-06	2.2E-05	3.1E-04

Relative Risk [ ]			
Diet 1	1.00027	1.0025	1.025
Diet 2	1.00011	1.00092	1.0099
Diet 3	1.000082	1.00068	1.008
Diet 4	1.00067	1.0057	1.077

Probability of Causation [%]			
Diet 1	0.027	0.250	2.44
Diet 2	0.011	0.092	0.98
Diet 3	0.008	0.068	0.80
Diet 4	0.067	0.566	7.16

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.24	1.3	6.9
Commercial Milk (locally produced)	0.052	0.3	1.8
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.52	3.6	23
Beef (locally produced)	0.00083	0.013	0.28
Leafy Vegetables (locally produced)	0.00023	0.0022	0.019
Eggs (locally produced)	0.014	0.095	0.59
Cottage Cheese (locally produced)	0.00049	0.005	0.05
Inhalation	0.015	0.053	0.18
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.29	1.5	7.9
Diet 2	0.11	0.51	2.7
Diet 3	0.08	0.36	2.1

Excess Lifetime Risk [ ]			
Diet 1	6.2E-08	3.0E-06	8.2E-05
Diet 2	2.4E-08	1.1E-06	3.1E-05
Diet 3	2.0E-08	7.8E-07	2.5E-05
Diet 4	1.8E-07	6.6E-06	2.3E-04

Relative Risk [ ]			
Diet 1	1.0001	1.002	1.045
Diet 2	1.000033	1.00073	1.016
Diet 3	1.000026	1.00051	1.012
Diet 4	1.00018	1.0052	1.13

Probability of Causation [%]			
Diet 1	0.010	0.197	4.30
Diet 2	0.003	0.073	1.59
Diet 3	0.003	0.051	1.15
Diet 4	0.018	0.518	11.37

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.096	0.51	2.9
Commercial Milk (locally produced)	0.016	0.12	0.73
Commercial Milk (regionally mixed)	0.042	0.25	1.5
Goat Milk (locally produced)	0.17	1.3	9.6
Beef (locally produced)	0.00028	0.0042	0.088
Leafy Vegetables (locally produced)	0.0001	0.0011	0.0092
Eggs (locally produced)	0.0061	0.044	0.26
Cottage Cheese (locally produced)	0.00021	0.0025	0.027
Inhalation	0.0067	0.023	0.092
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.12	0.6	3.3
Diet 2	0.041	0.21	1.1
Diet 3	0.055	0.28	1.6

Excess Lifetime Risk [ ]			
Diet 1	3.2E-07	4.6E-06	7.1E-05
Diet 2	1.2E-07	1.7E-06	2.3E-05
Diet 3	1.6E-07	2.2E-06	3.0E-05
Diet 4	7.6E-07	1.1E-05	1.8E-04

Relative Risk [ ]			
Diet 1	1.00013	1.0012	1.012
Diet 2	1.000047	1.00042	1.0052
Diet 3	1.000074	1.00064	1.0078
Diet 4	1.00027	1.0028	1.04

Probability of Causation [%]			
Diet 1	0.013	0.117	1.19
Diet 2	0.005	0.042	0.52
Diet 3	0.007	0.064	0.78
Diet 4	0.027	0.277	3.89

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.11	0.62	3.4
Commercial Milk (locally produced)	0.022	0.14	0.84
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.23	1.8	11
Beef (locally produced)	0.00042	0.0067	0.14
Leafy Vegetables (locally produced)	0.000093	0.0011	0.009
Eggs (locally produced)	0.0065	0.046	0.27
Cottage Cheese (locally produced)	0.00021	0.0026	0.024
Inhalation	0.0079	0.028	0.11
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.15	0.73	3.8
Diet 2	0.052	0.25	1.4
Diet 3	0.068	0.33	2

Excess Lifetime Risk [ ]			
Diet 1	3.2E-08	1.4E-06	4.0E-05
Diet 2	1.3E-08	5.1E-07	1.5E-05
Diet 3	1.9E-08	7.3E-07	2.4E-05
Diet 4	9.7E-08	3.3E-06	1.2E-04

Relative Risk [ ]			
Diet 1	1.000046	1.0011	1.023
Diet 2	1.000016	1.00036	1.0076
Diet 3	1.000023	1.00048	1.011
Diet 4	1.000098	1.0025	1.067

Probability of Causation [%]			
Diet 1	0.005	0.106	2.24
Diet 2	0.002	0.036	0.75
Diet 3	0.002	0.048	1.10
Diet 4	0.010	0.248	6.27

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**  
**Receptor: Female born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.18	0.94	5.2
Commercial Milk (locally produced)	0.036	0.22	1.3
Commercial Milk (regionally mixed)	0.043	0.25	1.5
Goat Milk (locally produced)	0.36	2.4	18
Beef (locally produced)	0.00049	0.0077	0.16
Leafy Vegetables (locally produced)	0.0002	0.002	0.017
Eggs (locally produced)	0.012	0.081	0.49
Cottage Cheese (locally produced)	0.00045	0.0046	0.049
Inhalation	0.012	0.038	0.13
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.22	1.1	6
Diet 2	0.079	0.37	2
Diet 3	0.064	0.29	1.6

Excess Lifetime Risk [ ]			
Diet 1	5.8E-07	8.1E-06	1.1E-04
Diet 2	2.3E-07	3.1E-06	3.7E-05
Diet 3	1.8E-07	2.4E-06	3.1E-05
Diet 4	1.4E-06	2.0E-05	2.7E-04

Relative Risk [ ]			
Diet 1	1.00022	1.0023	1.023
Diet 2	1.0001	1.00084	1.0092
Diet 3	1.000079	1.00067	1.008
Diet 4	1.00062	1.0051	1.068

Probability of Causation [%]			
Diet 1	0.022	0.227	2.26
Diet 2	0.010	0.084	0.92
Diet 3	0.008	0.067	0.79
Diet 4	0.062	0.503	6.33

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**

**Receptor: Male born in 1930**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.24	1.2	6.2
Commercial Milk (locally produced)	0.048	0.27	1.6
Commercial Milk (regionally mixed)	0.056	0.3	2
Goat Milk (locally produced)	0.49	3.3	21
Beef (locally produced)	0.00075	0.012	0.26
Leafy Vegetables (locally produced)	0.0002	0.002	0.017
Eggs (locally produced)	0.013	0.086	0.52
Cottage Cheese (locally produced)	0.00042	0.0046	0.044
Inhalation	0.014	0.046	0.16
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.28	1.4	7.2
Diet 2	0.1	0.46	2.5
Diet 3	0.078	0.35	2.1

Excess Lifetime Risk [ ]			
Diet 1	5.8E-08	2.7E-06	7.6E-05
Diet 2	2.2E-08	9.3E-07	3.1E-05
Diet 3	2.0E-08	7.7E-07	2.5E-05
Diet 4	1.6E-07	6.1E-06	2.2E-04

Relative Risk [ ]			
Diet 1	1.000091	1.0018	1.041
Diet 2	1.00003	1.00066	1.014
Diet 3	1.000026	1.00051	1.011
Diet 4	1.00016	1.0048	1.12

Probability of Causation [%]			
Diet 1	0.009	0.183	3.96
Diet 2	0.003	0.066	1.43
Diet 3	0.003	0.051	1.13
Diet 4	0.016	0.480	10.60

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2	11	71
Commercial Milk (locally produced)	0.48	3.2	21
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	5	34	220
Beef (locally produced)	0.0049	0.079	1.7
Leafy Vegetables (locally produced)	0.0016	0.02	0.17
Eggs (locally produced)	0.13	0.89	5.8
Cottage Cheese (locally produced)	0.0041	0.041	0.45
Inhalation	0.089	0.29	1
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2.4	13	79
Diet 2	0.87	4.7	27
Diet 3	0.2	0.75	3.5

Excess Lifetime Risk [ ]			
Diet 1	3.2E-05	4.3E-04	5.2E-03
Diet 2	1.5E-05	1.8E-04	2.1E-03
Diet 3	2.9E-06	2.7E-05	2.5E-04
Diet 4	1.1E-04	1.5E-03	1.8E-02

Relative Risk [ ]			
Diet 1	1.012	1.1	2.1
Diet 2	1.005	1.046	1.5
Diet 3	1.00098	1.0072	1.065
Diet 4	1.039	1.32	5.3

Probability of Causation [%]			
Diet 1	1.155	9.05	51.7
Diet 2	0.498	4.38	33.2
Diet 3	0.098	0.71	6.1
Diet 4	3.768	24.39	81.0

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**  
**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.4	13	80
Commercial Milk (locally produced)	0.55	3.5	24
Commercial Milk (regionally mixed)	0.078	0.47	3.1
Goat Milk (locally produced)	6.2	41	260
Beef (locally produced)	0.0069	0.11	2.2
Leafy Vegetables (locally produced)	0.0017	0.019	0.17
Eggs (locally produced)	0.14	1	6.8
Cottage Cheese (locally produced)	0.004	0.043	0.48
Inhalation	0.088	0.31	1.1
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2.8	15	90
Diet 2	0.97	5.6	31
Diet 3	0.21	0.84	4.2

Excess Lifetime Risk [ ]			
Diet 1	3.5E-06	1.1E-04	2.6E-03
Diet 2	1.5E-06	4.9E-05	1.2E-03
Diet 3	2.9E-07	7.4E-06	1.5E-04
Diet 4	9.9E-06	3.0E-04	8.2E-03

Relative Risk [ ]			
Diet 1	1.0035	1.075	2.6
Diet 2	1.0017	1.032	1.66
Diet 3	1.00027	1.0047	1.085
Diet 4	1.011	1.23	5.5

Probability of Causation [%]			
Diet 1	0.352	7.00	61.1
Diet 2	0.167	3.14	39.7
Diet 3	0.027	0.47	7.8
Diet 4	1.082	18.88	81.6

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.3	14	82
Commercial Milk (locally produced)	0.65	4	24
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	5.7	44	280
Beef (locally produced)	0.0057	0.098	2
Leafy Vegetables (locally produced)	0.0021	0.024	0.21
Eggs (locally produced)	0.17	1.1	7.2
Cottage Cheese (locally produced)	0.0046	0.053	0.51
Inhalation	0.11	0.35	1.2
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2.8	16	92
Diet 2	1.1	5.9	29
Diet 3	0.23	0.82	3.6

Excess Lifetime Risk [ ]			
Diet 1	3.8E-05	4.9E-04	6.2E-03
Diet 2	2.0E-05	2.2E-04	2.5E-03
Diet 3	3.2E-06	2.9E-05	2.6E-04
Diet 4	1.2E-04	1.8E-03	2.4E-02

Relative Risk [ ]			
Diet 1	1.014	1.12	2.4
Diet 2	1.006	1.058	1.59
Diet 3	1.0011	1.0078	1.071
Diet 4	1.043	1.41	6.3

Probability of Causation [%]			
Diet 1	1.362	11.07	57.7
Diet 2	0.597	5.52	37.1
Diet 3	0.107	0.77	6.6
Diet 4	4.087	28.93	84.1

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.9	16	89
Commercial Milk (locally produced)	0.81	4.4	26
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	6.8	49	320
Beef (locally produced)	0.0075	0.13	2.8
Leafy Vegetables (locally produced)	0.002	0.024	0.2
Eggs (locally produced)	0.18	1.3	8.7
Cottage Cheese (locally produced)	0.0054	0.053	0.54
Inhalation	0.11	0.39	1.3
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	3.5	18	99
Diet 2	1.2	6.7	35
Diet 3	0.22	0.92	4.4

Excess Lifetime Risk [ ]			
Diet 1	4.6E-06	1.4E-04	3.0E-03
Diet 2	1.6E-06	5.8E-05	1.4E-03
Diet 3	3.0E-07	8.0E-06	1.6E-04
Diet 4	1.3E-05	3.7E-04	9.4E-03

Relative Risk [ ]			
Diet 1	1.0044	1.09	2.8
Diet 2	1.002	1.039	1.73
Diet 3	1.00028	1.005	1.088
Diet 4	1.012	1.29	6

Probability of Causation [%]			
Diet 1	0.439	8.29	64.4
Diet 2	0.200	3.72	42.2
Diet 3	0.028	0.50	8.1
Diet 4	1.205	22.47	83.2

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.5	3	19
Commercial Milk (locally produced)	0.12	0.84	5.4
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0013	0.021	0.44
Leafy Vegetables (locally produced)	0.00043	0.0051	0.047
Eggs (locally produced)	0.031	0.23	1.5
Cottage Cheese (locally produced)	0.0011	0.011	0.12
Inhalation	0.023	0.078	0.27
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.59	3.4	21
Diet 2	0.22	1.3	7.2
Diet 3	0.11	0.52	2.9

Excess Lifetime Risk [ ]			
Diet 1	8.3E-06	1.1E-04	1.3E-03
Diet 2	3.9E-06	4.6E-05	5.5E-04
Diet 3	1.8E-06	2.0E-05	2.0E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.0028	1.027	1.29
Diet 2	1.0013	1.012	1.13
Diet 3	1.00064	1.0052	1.051
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.279	2.58	22.0
Diet 2	0.130	1.16	11.7
Diet 3	0.064	0.51	4.9
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.63	3.4	21
Commercial Milk (locally produced)	0.14	0.93	6.2
Commercial Milk (regionally mixed)	0.078	0.47	3.1
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0018	0.029	0.62
Leafy Vegetables (locally produced)	0.00041	0.0049	0.045
Eggs (locally produced)	0.035	0.27	1.8
Cottage Cheese (locally produced)	0.0011	0.011	0.12
Inhalation	0.022	0.085	0.29
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.73	3.8	24
Diet 2	0.25	1.4	8.2
Diet 3	0.12	0.58	3.4

Excess Lifetime Risk [ ]			
Diet 1	8.2E-07	2.9E-05	6.5E-04
Diet 2	3.7E-07	1.3E-05	2.9E-04
Diet 3	1.9E-07	5.3E-06	1.2E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.00087	1.019	1.43
Diet 2	1.00043	1.0082	1.18
Diet 3	1.00019	1.0033	1.068
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.087	1.85	29.3
Diet 2	0.043	0.81	15.3
Diet 3	0.019	0.33	6.4
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.3	7.9	48
Commercial Milk (locally produced)	0.35	2.2	15
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0031	0.056	1.2
Leafy Vegetables (locally produced)	0.0013	0.014	0.12
Eggs (locally produced)	0.088	0.61	4.2
Cottage Cheese (locally produced)	0.0031	0.03	0.33
Inhalation	0.062	0.21	0.71
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.6	9	54
Diet 2	0.64	3.3	19
Diet 3	0.17	0.65	3.2

Excess Lifetime Risk [ ]			
Diet 1	2.1E-05	3.0E-04	3.7E-03
Diet 2	1.1E-05	1.3E-04	1.5E-03
Diet 3	2.5E-06	2.4E-05	2.3E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.0085	1.073	1.81
Diet 2	1.0033	1.033	1.36
Diet 3	1.00085	1.0064	1.057
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.838	6.80	44.5
Diet 2	0.330	3.23	26.3
Diet 3	0.085	0.64	5.4
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.7	9.2	55
Commercial Milk (locally produced)	0.39	2.5	17
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0046	0.077	1.7
Leafy Vegetables (locally produced)	0.0013	0.013	0.12
Eggs (locally produced)	0.1	0.74	4.7
Cottage Cheese (locally produced)	0.0029	0.03	0.35
Inhalation	0.064	0.22	0.74
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.9	10	62
Diet 2	0.72	3.8	23
Diet 3	0.18	0.75	3.8

Excess Lifetime Risk [ ]			
Diet 1	2.4E-06	7.9E-05	1.9E-03
Diet 2	9.9E-07	3.5E-05	8.1E-04
Diet 3	2.5E-07	6.7E-06	1.4E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.0024	1.053	2.1
Diet 2	1.0011	1.023	1.47
Diet 3	1.00024	1.0042	1.079
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.243	5.06	52.8
Diet 2	0.114	2.20	31.8
Diet 3	0.024	0.42	7.3
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.3	7.7	45
Commercial Milk (locally produced)	0.35	2.2	14
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	3.5	24	150
Beef (locally produced)	0.0031	0.055	1.1
Leafy Vegetables (locally produced)	0.0013	0.014	0.12
Eggs (locally produced)	0.087	0.6	4.1
Cottage Cheese (locally produced)	0.003	0.03	0.31
Inhalation	0.063	0.21	0.72
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.6	8.9	51
Diet 2	0.65	3.3	19
Diet 3	0.17	0.66	3.2

Excess Lifetime Risk [ ]			
Diet 1	2.1E-05	3.0E-04	3.7E-03
Diet 2	1.1E-05	1.2E-04	1.4E-03
Diet 3	2.6E-06	2.4E-05	2.3E-04
Diet 4	6.9E-05	9.7E-04	1.4E-02

Relative Risk [ ]			
Diet 1	1.0081	1.071	1.77
Diet 2	1.0033	1.033	1.34
Diet 3	1.00085	1.0065	1.058
Diet 4	1.025	1.23	3.8

Probability of Causation [%]			
Diet 1	0.804	6.66	43.3
Diet 2	0.330	3.16	25.2
Diet 3	0.085	0.64	5.5
Diet 4	2.424	18.46	73.7

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.6	9.1	54
Commercial Milk (locally produced)	0.4	2.4	17
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	4.1	28	180
Beef (locally produced)	0.0044	0.075	1.6
Leafy Vegetables (locally produced)	0.0013	0.013	0.11
Eggs (locally produced)	0.1	0.74	4.6
Cottage Cheese (locally produced)	0.0029	0.029	0.33
Inhalation	0.064	0.22	0.76
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.9	10	60
Diet 2	0.72	3.8	22
Diet 3	0.18	0.75	3.8

Excess Lifetime Risk [ ]			
Diet 1	2.4E-06	7.8E-05	1.8E-03
Diet 2	9.5E-07	3.4E-05	7.7E-04
Diet 3	2.4E-07	6.7E-06	1.4E-04
Diet 4	6.9E-06	2.1E-04	5.7E-03

Relative Risk [ ]			
Diet 1	1.0024	1.052	2.1
Diet 2	1.0012	1.022	1.45
Diet 3	1.00023	1.0042	1.079
Diet 4	1.0077	1.16	4.1

Probability of Causation [%]			
Diet 1	0.240	4.90	51.2
Diet 2	0.118	2.16	31.0
Diet 3	0.023	0.42	7.4
Diet 4	0.763	13.87	75.1

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.19	1.1	7.5
Commercial Milk (locally produced)	0.047	0.32	2.4
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.48	3.5	26
Beef (locally produced)	0.00044	0.008	0.17
Leafy Vegetables (locally produced)	0.00017	0.0019	0.019
Eggs (locally produced)	0.013	0.085	0.64
Cottage Cheese (locally produced)	0.00037	0.0041	0.057
Inhalation	0.009	0.031	0.12
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.22	1.2	8.4
Diet 2	0.087	0.48	3.1
Diet 3	0.092	0.46	2.7

Excess Lifetime Risk [ ]			
Diet 1	3.2E-06	4.3E-05	6.0E-04
Diet 2	1.6E-06	1.8E-05	2.2E-04
Diet 3	1.6E-06	1.8E-05	1.9E-04
Diet 4	9.9E-06	1.3E-04	1.8E-03

Relative Risk [ ]			
Diet 1	1.0011	1.0098	1.13
Diet 2	1.00048	1.0044	1.06
Diet 3	1.00056	1.0047	1.049
Diet 4	1.0032	1.032	1.48

Probability of Causation [%]			
Diet 1	0.106	0.97	11.4
Diet 2	0.048	0.44	5.7
Diet 3	0.056	0.47	4.7
Diet 4	0.315	3.06	32.4

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.22	1.3	8.4
Commercial Milk (locally produced)	0.05	0.35	2.7
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	0.54	4	30
Beef (locally produced)	0.00061	0.011	0.23
Leafy Vegetables (locally produced)	0.00017	0.0019	0.018
Eggs (locally produced)	0.014	0.1	0.71
Cottage Cheese (locally produced)	0.00038	0.0041	0.055
Inhalation	0.0099	0.034	0.13
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.27	1.4	9.3
Diet 2	0.098	0.53	3.5
Diet 3	0.099	0.51	3.2

Excess Lifetime Risk [ ]			
Diet 1	2.9E-07	1.0E-05	2.7E-04
Diet 2	1.5E-07	4.8E-06	1.2E-04
Diet 3	1.8E-07	4.8E-06	1.2E-04
Diet 4	9.9E-07	3.0E-05	9.0E-04

Relative Risk [ ]			
Diet 1	1.00032	1.0076	1.16
Diet 2	1.00015	1.0033	1.065
Diet 3	1.00017	1.0031	1.065
Diet 4	1.00097	1.023	1.46

Probability of Causation [%]			
Diet 1	0.032	0.75	14.0
Diet 2	0.015	0.33	6.1
Diet 3	0.017	0.31	6.1
Diet 4	0.097	2.25	31.5

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0019	0.022	0.22
Inhalation	0.046	0.15	0.54
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.14	0.59	3.1

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.2E-06	2.2E-05	2.2E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00078	1.0059	1.055
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.078	0.59	5.3
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0021	0.022	0.23
Inhalation	0.047	0.17	0.57
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.15	0.68	3.6

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.2E-07	6.1E-06	1.4E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00022	1.0038	1.075
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.022	0.38	6.9
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.3	7.3	38
Commercial Milk (locally produced)	0.34	2.1	14
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	3.4	23	150
Beef (locally produced)	0.003	0.054	1.1
Leafy Vegetables (locally produced)	0.0013	0.013	0.1
Eggs (locally produced)	0.09	0.57	3.6
Cottage Cheese (locally produced)	0.0028	0.027	0.29
Inhalation	0.064	0.2	0.71
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.6	8.5	43
Diet 2	0.64	3.1	19
Diet 3	0.16	0.65	3.2

Excess Lifetime Risk [ ]			
Diet 1	2.3E-05	2.7E-04	3.3E-03
Diet 2	1.0E-05	1.1E-04	1.4E-03
Diet 3	2.4E-06	2.4E-05	2.3E-04
Diet 4	6.5E-05	9.4E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.0084	1.068	1.76
Diet 2	1.0034	1.03	1.33
Diet 3	1.00085	1.0064	1.058
Diet 4	1.024	1.22	3.6

Probability of Causation [%]			
Diet 1	0.834	6.33	43.1
Diet 2	0.339	2.94	24.5
Diet 3	0.085	0.64	5.4
Diet 4	2.359	17.74	71.9

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.7	8.5	46
Commercial Milk (locally produced)	0.4	2.3	16
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	3.9	27	170
Beef (locally produced)	0.0042	0.074	1.4
Leafy Vegetables (locally produced)	0.0013	0.013	0.1
Eggs (locally produced)	0.11	0.68	4.3
Cottage Cheese (locally produced)	0.0029	0.028	0.28
Inhalation	0.064	0.21	0.8
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.9	9.6	52
Diet 2	0.7	3.5	21
Diet 3	0.18	0.74	3.9

Excess Lifetime Risk [ ]			
Diet 1	2.2E-06	7.2E-05	1.7E-03
Diet 2	7.9E-07	3.1E-05	7.1E-04
Diet 3	2.3E-07	6.7E-06	1.4E-04
Diet 4	6.5E-06	2.0E-04	5.3E-03

Relative Risk [ ]			
Diet 1	1.0021	1.047	2
Diet 2	1.0011	1.02	1.42
Diet 3	1.00023	1.0041	1.079
Diet 4	1.0071	1.15	4

Probability of Causation [%]			
Diet 1	0.213	4.52	50.0
Diet 2	0.106	1.96	29.8
Diet 3	0.023	0.41	7.3
Diet 4	0.703	13.12	75.3

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.24	1.5	9.7
Commercial Milk (locally produced)	0.067	0.43	3
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.69	4.7	32
Beef (locally produced)	0.00068	0.01	0.21
Leafy Vegetables (locally produced)	0.00024	0.0026	0.024
Eggs (locally produced)	0.016	0.12	0.87
Cottage Cheese (locally produced)	0.00052	0.0056	0.069
Inhalation	0.012	0.043	0.17
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.28	1.7	11
Diet 2	0.13	0.65	4.3
Diet 3	0.097	0.47	2.8

Excess Lifetime Risk [ ]			
Diet 1	4.0E-06	5.7E-05	7.8E-04
Diet 2	1.8E-06	2.4E-05	2.8E-04
Diet 3	1.6E-06	1.9E-05	1.9E-04
Diet 4	1.2E-05	2.0E-04	2.7E-03

Relative Risk [ ]			
Diet 1	1.0014	1.013	1.17
Diet 2	1.00074	1.006	1.089
Diet 3	1.00058	1.0048	1.049
Diet 4	1.0054	1.043	1.6

Probability of Causation [%]			
Diet 1	0.144	1.32	14.2
Diet 2	0.074	0.60	8.2
Diet 3	0.058	0.48	4.7
Diet 4	0.534	4.12	37.4

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.3	1.8	10
Commercial Milk (locally produced)	0.073	0.49	3.6
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	0.77	5.4	39
Beef (locally produced)	0.00098	0.015	0.33
Leafy Vegetables (locally produced)	0.00023	0.0026	0.025
Eggs (locally produced)	0.019	0.14	1
Cottage Cheese (locally produced)	0.00052	0.0058	0.071
Inhalation	0.013	0.048	0.17
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.35	2	11
Diet 2	0.15	0.73	4.9
Diet 3	0.1	0.53	3.2

Excess Lifetime Risk [ ]			
Diet 1	4.2E-07	1.5E-05	3.4E-04
Diet 2	2.0E-07	6.9E-06	1.6E-04
Diet 3	1.8E-07	4.9E-06	1.2E-04
Diet 4	1.4E-06	4.1E-05	1.2E-03

Relative Risk [ ]			
Diet 1	1.00046	1.0099	1.24
Diet 2	1.00022	1.0046	1.093
Diet 3	1.00017	1.0032	1.066
Diet 4	1.0013	1.033	1.61

Probability of Causation [%]			
Diet 1	0.046	0.98	19.1
Diet 2	0.022	0.46	8.5
Diet 3	0.017	0.31	6.2
Diet 4	0.134	3.16	37.6

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0011	0.012	0.12
Inhalation	0.027	0.09	0.33
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.12	0.53	2.9

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.9E-06	2.0E-05	2.0E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00067	1.0054	1.051
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.067	0.53	4.9
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0014	0.013	0.13
Inhalation	0.029	0.099	0.34
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.12	0.59	3.4

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.0E-07	5.3E-06	1.3E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0002	1.0034	1.069
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.020	0.34	6.5
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways  
Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways  
Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)  
Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.23	1.4	9.9
Commercial Milk (locally produced)	0.06	0.41	2.9
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.58	4.5	32
Beef (locally produced)	0.00058	0.01	0.23
Leafy Vegetables (locally produced)	0.00026	0.0025	0.023
Eggs (locally produced)	0.015	0.11	0.83
Cottage Cheese (locally produced)	0.00046	0.0055	0.067
Inhalation	0.011	0.041	0.15
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.28	1.6	11
Diet 2	0.11	0.61	3.7
Diet 3	0.094	0.47	2.8

Excess Lifetime Risk [ ]			
Diet 1	3.7E-06	5.5E-05	7.7E-04
Diet 2	1.9E-06	2.4E-05	3.1E-04
Diet 3	1.6E-06	1.9E-05	2.0E-04
Diet 4	1.4E-05	1.8E-04	2.6E-03

Relative Risk [ ]			
Diet 1	1.0014	1.013	1.14
Diet 2	1.00065	1.0056	1.074
Diet 3	1.00057	1.0048	1.05
Diet 4	1.0047	1.041	1.56

Probability of Causation [%]			
Diet 1	0.140	1.27	12.4
Diet 2	0.065	0.56	6.8
Diet 3	0.057	0.48	4.7
Diet 4	0.465	3.92	35.9

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	1.6	11
Commercial Milk (locally produced)	0.073	0.46	3.6
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	0.68	5.2	39
Beef (locally produced)	0.00087	0.015	0.34
Leafy Vegetables (locally produced)	0.00025	0.0025	0.023
Eggs (locally produced)	0.017	0.13	0.9
Cottage Cheese (locally produced)	0.00054	0.0055	0.065
Inhalation	0.012	0.043	0.16
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.32	1.8	12
Diet 2	0.12	0.69	4.8
Diet 3	0.1	0.52	3.2

Excess Lifetime Risk [ ]			
Diet 1	4.3E-07	1.4E-05	3.2E-04
Diet 2	1.8E-07	5.9E-06	1.4E-04
Diet 3	1.8E-07	4.9E-06	1.2E-04
Diet 4	1.3E-06	3.9E-05	1.2E-03

Relative Risk [ ]			
Diet 1	1.00041	1.0096	1.22
Diet 2	1.00021	1.0042	1.096
Diet 3	1.00017	1.0031	1.065
Diet 4	1.0012	1.03	1.71

Probability of Causation [%]			
Diet 1	0.041	0.95	17.8
Diet 2	0.021	0.42	8.7
Diet 3	0.017	0.31	6.1
Diet 4	0.116	2.87	41.4

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0018	0.018	0.19
Inhalation	0.043	0.14	0.48
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.14	0.58	3

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.2E-06	2.2E-05	2.2E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00075	1.0058	1.054
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.075	0.58	5.1
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0019	0.019	0.19
Inhalation	0.043	0.14	0.52
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.15	0.66	3.6

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.2E-07	5.9E-06	1.3E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00021	1.0037	1.073
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.021	0.37	6.8
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**

**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.3	6.9	41
Commercial Milk (locally produced)	0.33	2	13
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	3.3	22	130
Beef (locally produced)	0.0029	0.048	0.96
Leafy Vegetables (locally produced)	0.0012	0.013	0.11
Eggs (locally produced)	0.081	0.54	3.6
Cottage Cheese (locally produced)	0.0026	0.026	0.28
Inhalation	0.06	0.2	0.72
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.5	7.9	47
Diet 2	0.58	3	18
Diet 3	0.16	0.64	3.2

Excess Lifetime Risk [ ]			
Diet 1	1.9E-05	2.6E-04	3.1E-03
Diet 2	9.0E-06	1.1E-04	1.3E-03
Diet 3	2.5E-06	2.4E-05	2.3E-04
Diet 4	6.2E-05	9.2E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.0072	1.064	1.68
Diet 2	1.0033	1.029	1.3
Diet 3	1.00084	1.0063	1.057
Diet 4	1.024	1.2	3.6

Probability of Causation [%]			
Diet 1	0.715	6.00	40.4
Diet 2	0.326	2.80	23.2
Diet 3	0.084	0.63	5.4
Diet 4	2.369	16.87	72.4

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.4	8.1	45
Commercial Milk (locally produced)	0.38	2.3	15
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	3.8	26	160
Beef (locally produced)	0.0042	0.068	1.4
Leafy Vegetables (locally produced)	0.0011	0.012	0.1
Eggs (locally produced)	0.09	0.64	4.4
Cottage Cheese (locally produced)	0.0026	0.027	0.31
Inhalation	0.063	0.22	0.74
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.6	9.2	52
Diet 2	0.66	3.5	21
Diet 3	0.18	0.74	3.8

Excess Lifetime Risk [ ]			
Diet 1	2.2E-06	6.8E-05	1.5E-03
Diet 2	9.7E-07	3.2E-05	7.1E-04
Diet 3	2.5E-07	6.6E-06	1.4E-04
Diet 4	6.5E-06	1.9E-04	4.8E-03

Relative Risk [ ]			
Diet 1	1.0022	1.045	2
Diet 2	1.0011	1.02	1.38
Diet 3	1.00023	1.0041	1.077
Diet 4	1.0066	1.15	3.9

Probability of Causation [%]			
Diet 1	0.218	4.32	50.8
Diet 2	0.105	1.99	27.6
Diet 3	0.023	0.41	7.1
Diet 4	0.659	12.71	74.0

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.18	1.1	6.9
Commercial Milk (locally produced)	0.048	0.31	2.2
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.45	3.3	23
Beef (locally produced)	0.00043	0.0077	0.16
Leafy Vegetables (locally produced)	0.00016	0.0019	0.019
Eggs (locally produced)	0.012	0.082	0.63
Cottage Cheese (locally produced)	0.00035	0.0042	0.048
Inhalation	0.0092	0.031	0.12
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.21	1.2	7.7
Diet 2	0.088	0.46	2.9
Diet 3	0.091	0.46	2.7

Excess Lifetime Risk [ ]			
Diet 1	3.1E-06	4.0E-05	5.4E-04
Diet 2	1.5E-06	1.7E-05	2.3E-04
Diet 3	1.5E-06	1.8E-05	1.9E-04
Diet 4	9.7E-06	1.3E-04	1.8E-03

Relative Risk [ ]			
Diet 1	1.00099	1.01	1.12
Diet 2	1.00049	1.0044	1.056
Diet 3	1.00056	1.0047	1.049
Diet 4	1.0035	1.032	1.42

Probability of Causation [%]			
Diet 1	0.099	0.99	10.5
Diet 2	0.049	0.44	5.3
Diet 3	0.056	0.47	4.7
Diet 4	0.344	3.07	29.4

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.21	1.2	7.7
Commercial Milk (locally produced)	0.054	0.35	2.6
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	0.51	3.9	28
Beef (locally produced)	0.00063	0.011	0.24
Leafy Vegetables (locally produced)	0.00016	0.0019	0.018
Eggs (locally produced)	0.013	0.097	0.67
Cottage Cheese (locally produced)	0.00038	0.0042	0.045
Inhalation	0.0096	0.034	0.13
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.25	1.4	8.5
Diet 2	0.097	0.53	3.5
Diet 3	0.096	0.51	3.2

Excess Lifetime Risk [ ]			
Diet 1	2.8E-07	1.0E-05	2.6E-04
Diet 2	1.4E-07	4.7E-06	1.1E-04
Diet 3	1.7E-07	4.8E-06	1.2E-04
Diet 4	9.7E-07	3.1E-05	8.4E-04

Relative Risk [ ]			
Diet 1	1.00033	1.0074	1.16
Diet 2	1.00016	1.0032	1.07
Diet 3	1.00017	1.0031	1.065
Diet 4	1.00084	1.022	1.53

Probability of Causation [%]			
Diet 1	0.033	0.74	13.5
Diet 2	0.016	0.32	6.5
Diet 3	0.017	0.31	6.1
Diet 4	0.084	2.12	34.1

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.4	37
Commercial Milk (locally produced)	0.29	1.8	12
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	3	20	120
Beef (locally produced)	0.0026	0.045	0.89
Leafy Vegetables (locally produced)	0.0011	0.011	0.1
Eggs (locally produced)	0.075	0.49	3.2
Cottage Cheese (locally produced)	0.0022	0.024	0.26
Inhalation	0.057	0.18	0.65
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.3	7.2	43
Diet 2	0.53	2.7	15
Diet 3	0.16	0.63	3.1

Excess Lifetime Risk [ ]			
Diet 1	1.8E-05	2.4E-04	3.1E-03
Diet 2	9.1E-06	1.0E-04	1.3E-03
Diet 3	2.5E-06	2.3E-05	2.3E-04
Diet 4	5.9E-05	8.0E-04	1.1E-02

Relative Risk [ ]			
Diet 1	1.0067	1.058	1.63
Diet 2	1.003	1.026	1.29
Diet 3	1.00082	1.0062	1.057
Diet 4	1.022	1.19	3.4

Probability of Causation [%]			
Diet 1	0.668	5.49	38.4
Diet 2	0.294	2.57	22.3
Diet 3	0.082	0.61	5.4
Diet 4	2.136	15.73	70.4

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.4	7.4	43
Commercial Milk (locally produced)	0.33	2	13
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	3.4	23	150
Beef (locally produced)	0.0036	0.063	1.2
Leafy Vegetables (locally produced)	0.001	0.011	0.096
Eggs (locally produced)	0.084	0.59	3.6
Cottage Cheese (locally produced)	0.0022	0.024	0.27
Inhalation	0.059	0.2	0.66
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.7	8.4	49
Diet 2	0.62	3.1	18
Diet 3	0.18	0.72	3.7

Excess Lifetime Risk [ ]			
Diet 1	2.0E-06	6.1E-05	1.4E-03
Diet 2	8.8E-07	2.7E-05	6.4E-04
Diet 3	2.4E-07	6.5E-06	1.4E-04
Diet 4	5.9E-06	1.7E-04	4.5E-03

Relative Risk [ ]			
Diet 1	1.0017	1.042	1.9
Diet 2	1.00094	1.019	1.36
Diet 3	1.00023	1.0041	1.076
Diet 4	1.0058	1.13	3.5

Probability of Causation [%]			
Diet 1	0.171	3.99	47.3
Diet 2	0.094	1.83	26.4
Diet 3	0.023	0.41	7.1
Diet 4	0.575	11.71	71.4

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.48	2.7	16
Commercial Milk (locally produced)	0.12	0.77	5.1
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	1.3	8.3	54
Beef (locally produced)	0.0012	0.019	0.36
Leafy Vegetables (locally produced)	0.00043	0.0048	0.042
Eggs (locally produced)	0.032	0.2	1.4
Cottage Cheese (locally produced)	0.00091	0.01	0.12
Inhalation	0.023	0.076	0.27
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.57	3	18
Diet 2	0.22	1.2	7.1
Diet 3	0.12	0.51	2.9

Excess Lifetime Risk [ ]			
Diet 1	7.6E-06	1.0E-04	1.3E-03
Diet 2	3.7E-06	4.3E-05	5.3E-04
Diet 3	1.9E-06	2.0E-05	2.0E-04
Diet 4	2.5E-05	3.4E-04	4.3E-03

Relative Risk [ ]			
Diet 1	1.0028	1.025	1.28
Diet 2	1.0012	1.011	1.13
Diet 3	1.00064	1.0051	1.051
Diet 4	1.0089	1.076	2.1

Probability of Causation [%]			
Diet 1	0.282	2.39	21.6
Diet 2	0.122	1.07	11.1
Diet 3	0.064	0.51	4.9
Diet 4	0.881	6.97	51.3

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.58	3.1	18
Commercial Milk (locally produced)	0.14	0.86	6
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	1.5	9.7	62
Beef (locally produced)	0.0016	0.026	0.55
Leafy Vegetables (locally produced)	0.00042	0.0045	0.042
Eggs (locally produced)	0.035	0.25	1.7
Cottage Cheese (locally produced)	0.00094	0.01	0.12
Inhalation	0.024	0.084	0.29
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.67	3.5	21
Diet 2	0.26	1.3	8.1
Diet 3	0.12	0.57	3.4

Excess Lifetime Risk [ ]			
Diet 1	7.9E-07	2.6E-05	5.9E-04
Diet 2	3.8E-07	1.2E-05	2.8E-04
Diet 3	2.0E-07	5.3E-06	1.2E-04
Diet 4	2.7E-06	7.1E-05	1.9E-03

Relative Risk [ ]			
Diet 1	1.00078	1.018	1.4
Diet 2	1.00039	1.0079	1.15
Diet 3	1.00019	1.0033	1.068
Diet 4	1.0025	1.055	2.1

Probability of Causation [%]			
Diet 1	0.078	1.73	27.7
Diet 2	0.039	0.78	13.1
Diet 3	0.019	0.33	6.4
Diet 4	0.249	5.16	50.5

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0011	0.011	0.12
Inhalation	0.025	0.084	0.3
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.12	0.52	2.9

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.9E-06	2.0E-05	2.0E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00066	1.0052	1.051
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.066	0.52	4.9
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0011	0.011	0.13
Inhalation	0.026	0.091	0.32
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.12	0.58	3.4

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.9E-07	5.3E-06	1.3E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00019	1.0034	1.069
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.019	0.34	6.4
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.54	3.2	20
Commercial Milk (locally produced)	0.15	0.9	6.1
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	1.5	9.8	62
Beef (locally produced)	0.0013	0.023	0.51
Leafy Vegetables (locally produced)	0.00056	0.0057	0.052
Eggs (locally produced)	0.036	0.25	1.7
Cottage Cheese (locally produced)	0.0013	0.012	0.13
Inhalation	0.029	0.1	0.34
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.67	3.6	23
Diet 2	0.27	1.4	8
Diet 3	0.12	0.54	2.9

Excess Lifetime Risk [ ]			
Diet 1	8.8E-06	1.2E-04	1.5E-03
Diet 2	4.8E-06	5.3E-05	6.5E-04
Diet 3	2.0E-06	2.1E-05	2.1E-04
Diet 4	3.0E-05	4.0E-04	6.1E-03

Relative Risk [ ]			
Diet 1	1.0035	1.03	1.3
Diet 2	1.0014	1.013	1.14
Diet 3	1.00067	1.0054	1.052
Diet 4	1.011	1.093	2.2

Probability of Causation [%]			
Diet 1	0.352	2.92	23.1
Diet 2	0.138	1.33	12.2
Diet 3	0.067	0.54	4.9
Diet 4	1.055	8.53	53.6

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.71	3.8	22
Commercial Milk (locally produced)	0.16	1	7.1
Commercial Milk (regionally mixed)	0.078	0.47	3.1
Goat Milk (locally produced)	1.7	11	73
Beef (locally produced)	0.0019	0.032	0.69
Leafy Vegetables (locally produced)	0.00055	0.0056	0.05
Eggs (locally produced)	0.04	0.29	2
Cottage Cheese (locally produced)	0.0012	0.012	0.15
Inhalation	0.031	0.11	0.37
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.83	4.3	24
Diet 2	0.3	1.6	9.2
Diet 3	0.13	0.61	3.4

Excess Lifetime Risk [ ]			
Diet 1	9.7E-07	3.1E-05	8.1E-04
Diet 2	4.4E-07	1.4E-05	3.5E-04
Diet 3	2.0E-07	5.5E-06	1.3E-04
Diet 4	3.2E-06	8.8E-05	2.5E-03

Relative Risk [ ]			
Diet 1	1.00096	1.022	1.45
Diet 2	1.00047	1.0095	1.19
Diet 3	1.0002	1.0034	1.071
Diet 4	1.0027	1.067	2.5

Probability of Causation [%]			
Diet 1	0.096	2.18	31.2
Diet 2	0.046	0.94	15.6
Diet 3	0.020	0.34	6.6
Diet 4	0.270	6.32	59.1

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.64	3.6	20
Commercial Milk (locally produced)	0.17	1.1	6.3
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	1.8	11	76
Beef (locally produced)	0.0014	0.026	0.59
Leafy Vegetables (locally produced)	0.00055	0.0065	0.059
Eggs (locally produced)	0.045	0.28	1.9
Cottage Cheese (locally produced)	0.0013	0.014	0.14
Inhalation	0.034	0.11	0.41
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.77	4.1	23
Diet 2	0.31	1.6	8.4
Diet 3	0.13	0.55	2.9

Excess Lifetime Risk [ ]			
Diet 1	1.1E-05	1.4E-04	1.6E-03
Diet 2	4.8E-06	5.7E-05	6.5E-04
Diet 3	2.0E-06	2.1E-05	2.1E-04
Diet 4	3.3E-05	4.6E-04	5.9E-03

Relative Risk [ ]			
Diet 1	1.0041	1.034	1.35
Diet 2	1.0016	1.015	1.15
Diet 3	1.00072	1.0055	1.052
Diet 4	1.012	1.11	2.4

Probability of Causation [%]			
Diet 1	0.407	3.27	25.7
Diet 2	0.164	1.49	13.2
Diet 3	0.072	0.55	4.9
Diet 4	1.184	9.55	57.6

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.84	4.1	23
Commercial Milk (locally produced)	0.19	1.2	7.6
Commercial Milk (regionally mixed)	0.078	0.47	3.1
Goat Milk (locally produced)	2.1	13	86
Beef (locally produced)	0.0021	0.036	0.86
Leafy Vegetables (locally produced)	0.00055	0.0063	0.058
Eggs (locally produced)	0.049	0.33	2.1
Cottage Cheese (locally produced)	0.0014	0.014	0.15
Inhalation	0.033	0.12	0.41
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.99	4.7	26
Diet 2	0.35	1.8	10
Diet 3	0.14	0.62	3.5

Excess Lifetime Risk [ ]			
Diet 1	1.1E-06	3.4E-05	8.7E-04
Diet 2	4.9E-07	1.6E-05	3.8E-04
Diet 3	2.1E-07	5.6E-06	1.3E-04
Diet 4	3.6E-06	9.7E-05	2.8E-03

Relative Risk [ ]			
Diet 1	1.0011	1.023	1.52
Diet 2	1.00056	1.01	1.22
Diet 3	1.0002	1.0035	1.071
Diet 4	1.0034	1.074	2.6

Probability of Causation [%]			
Diet 1	0.113	2.27	34.3
Diet 2	0.056	1.02	17.8
Diet 3	0.020	0.35	6.6
Diet 4	0.334	6.91	61.1

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.42	2.2	11
Commercial Milk (locally produced)	0.1	0.61	4.4
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.00096	0.016	0.32
Leafy Vegetables (locally produced)	0.00042	0.004	0.033
Eggs (locally produced)	0.027	0.17	1.1
Cottage Cheese (locally produced)	0.00084	0.0083	0.089
Inhalation	0.02	0.071	0.26
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.51	2.5	13
Diet 2	0.19	0.93	5.4
Diet 3	0.11	0.5	2.8

Excess Lifetime Risk [ ]			
Diet 1	6.7E-06	8.1E-05	1.1E-03
Diet 2	3.1E-06	3.5E-05	4.2E-04
Diet 3	1.8E-06	2.0E-05	2.0E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.0024	1.02	1.23
Diet 2	1.0011	1.0091	1.11
Diet 3	1.00062	1.0051	1.051
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.244	1.93	18.5
Diet 2	0.105	0.91	9.9
Diet 3	0.062	0.51	4.8
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.49	2.6	14
Commercial Milk (locally produced)	0.12	0.69	5
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0013	0.022	0.4
Leafy Vegetables (locally produced)	0.00041	0.004	0.032
Eggs (locally produced)	0.032	0.2	1.3
Cottage Cheese (locally produced)	0.00087	0.0084	0.081
Inhalation	0.022	0.075	0.28
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.57	3	15
Diet 2	0.23	1	6.4
Diet 3	0.12	0.57	3.3

Excess Lifetime Risk [ ]			
Diet 1	5.8E-07	2.2E-05	4.7E-04
Diet 2	2.4E-07	9.3E-06	2.2E-04
Diet 3	1.9E-07	5.2E-06	1.3E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.00076	1.014	1.28
Diet 2	1.00031	1.0065	1.13
Diet 3	1.00018	1.0033	1.067
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.076	1.43	21.9
Diet 2	0.031	0.65	11.2
Diet 3	0.018	0.33	6.2
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.47	2.8	15
Commercial Milk (locally produced)	0.13	0.82	4.9
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	1.3	9	58
Beef (locally produced)	0.0012	0.02	0.41
Leafy Vegetables (locally produced)	0.00048	0.0049	0.046
Eggs (locally produced)	0.034	0.21	1.4
Cottage Cheese (locally produced)	0.00089	0.011	0.11
Inhalation	0.027	0.091	0.33
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.57	3.2	18
Diet 2	0.24	1.2	6.9
Diet 3	0.12	0.53	2.9

Excess Lifetime Risk [ ]			
Diet 1	7.7E-06	1.1E-04	1.3E-03
Diet 2	4.1E-06	4.7E-05	5.4E-04
Diet 3	1.9E-06	2.0E-05	2.1E-04
Diet 4	2.7E-05	3.4E-04	4.5E-03

Relative Risk [ ]			
Diet 1	1.0031	1.026	1.28
Diet 2	1.0015	1.012	1.13
Diet 3	1.00068	1.0053	1.052
Diet 4	1.01	1.084	2

Probability of Causation [%]			
Diet 1	0.304	2.52	21.8
Diet 2	0.149	1.17	11.6
Diet 3	0.068	0.53	5.0
Diet 4	1.001	7.74	50.3

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.63	3.4	19
Commercial Milk (locally produced)	0.15	0.89	6
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	1.5	10	67
Beef (locally produced)	0.0017	0.028	0.64
Leafy Vegetables (locally produced)	0.00047	0.0051	0.042
Eggs (locally produced)	0.036	0.25	1.7
Cottage Cheese (locally produced)	0.0011	0.011	0.11
Inhalation	0.028	0.099	0.35
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.74	3.8	21
Diet 2	0.28	1.4	8.5
Diet 3	0.12	0.59	3.4

Excess Lifetime Risk [ ]			
Diet 1	8.4E-07	2.7E-05	7.0E-04
Diet 2	3.7E-07	1.3E-05	2.9E-04
Diet 3	2.0E-07	5.4E-06	1.3E-04
Diet 4	2.8E-06	7.8E-05	2.2E-03

Relative Risk [ ]			
Diet 1	1.00078	1.019	1.4
Diet 2	1.00041	1.0083	1.17
Diet 3	1.0002	1.0034	1.069
Diet 4	1.0025	1.054	2.3

Probability of Causation [%]			
Diet 1	0.078	1.86	28.4
Diet 2	0.041	0.83	14.5
Diet 3	0.020	0.33	6.5
Diet 4	0.247	5.15	56.3

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.65	3.8	21
Commercial Milk (locally produced)	0.18	1.1	6.2
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	1.8	12	79
Beef (locally produced)	0.0015	0.027	0.56
Leafy Vegetables (locally produced)	0.00061	0.0068	0.059
Eggs (locally produced)	0.047	0.3	2
Cottage Cheese (locally produced)	0.0013	0.014	0.14
Inhalation	0.038	0.12	0.45
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.81	4.5	24
Diet 2	0.33	1.7	8.2
Diet 3	0.14	0.56	3

Excess Lifetime Risk [ ]			
Diet 1	1.2E-05	1.5E-04	1.7E-03
Diet 2	5.7E-06	6.2E-05	7.3E-04
Diet 3	2.1E-06	2.1E-05	2.1E-04
Diet 4	3.4E-05	4.9E-04	6.4E-03

Relative Risk [ ]			
Diet 1	1.0043	1.035	1.34
Diet 2	1.0018	1.017	1.16
Diet 3	1.00075	1.0057	1.053
Diet 4	1.013	1.11	2.5

Probability of Causation [%]			
Diet 1	0.433	3.36	25.6
Diet 2	0.177	1.65	13.5
Diet 3	0.075	0.56	5.1
Diet 4	1.285	9.97	59.2

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.86	4.4	23
Commercial Milk (locally produced)	0.21	1.2	7.5
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	2	14	94
Beef (locally produced)	0.0022	0.038	0.83
Leafy Vegetables (locally produced)	0.00056	0.0067	0.056
Eggs (locally produced)	0.052	0.35	2.3
Cottage Cheese (locally produced)	0.0015	0.015	0.15
Inhalation	0.038	0.14	0.45
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1	5	26
Diet 2	0.38	1.9	9.9
Diet 3	0.14	0.64	3.6

Excess Lifetime Risk [ ]			
Diet 1	1.2E-06	3.7E-05	9.0E-04
Diet 2	5.0E-07	1.7E-05	3.9E-04
Diet 3	2.1E-07	5.7E-06	1.3E-04
Diet 4	3.8E-06	1.1E-04	2.8E-03

Relative Risk [ ]			
Diet 1	1.0011	1.025	1.54
Diet 2	1.00058	1.011	1.22
Diet 3	1.00021	1.0036	1.071
Diet 4	1.0035	1.078	2.5

Probability of Causation [%]			
Diet 1	0.115	2.49	34.9
Diet 2	0.058	1.10	17.9
Diet 3	0.021	0.36	6.7
Diet 4	0.348	7.25	60.3

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**

**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.38	2.1	13
Commercial Milk (locally produced)	0.091	0.63	3.9
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	1	6.7	44
Beef (locally produced)	0.00093	0.015	0.31
Leafy Vegetables (locally produced)	0.00035	0.0038	0.034
Eggs (locally produced)	0.025	0.17	1.1
Cottage Cheese (locally produced)	0.00079	0.0079	0.09
Inhalation	0.022	0.073	0.25
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.46	2.5	14
Diet 2	0.18	0.94	5.3
Diet 3	0.11	0.5	2.9

Excess Lifetime Risk [ ]			
Diet 1	6.4E-06	8.2E-05	1.0E-03
Diet 2	3.2E-06	3.6E-05	4.2E-04
Diet 3	1.8E-06	2.0E-05	2.0E-04
Diet 4	2.0E-05	2.7E-04	3.5E-03

Relative Risk [ ]			
Diet 1	1.0024	1.02	1.2
Diet 2	1.001	1.0089	1.096
Diet 3	1.00063	1.0051	1.051
Diet 4	1.0076	1.062	1.84

Probability of Causation [%]			
Diet 1	0.237	1.96	16.7
Diet 2	0.100	0.88	8.7
Diet 3	0.063	0.51	4.8
Diet 4	0.751	5.83	45.6

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.48	2.5	15
Commercial Milk (locally produced)	0.11	0.69	4.6
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	1.1	7.8	50
Beef (locally produced)	0.0014	0.021	0.44
Leafy Vegetables (locally produced)	0.00035	0.0037	0.033
Eggs (locally produced)	0.028	0.2	1.3
Cottage Cheese (locally produced)	0.00078	0.0082	0.091
Inhalation	0.022	0.08	0.28
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.56	2.8	17
Diet 2	0.2	1.1	6.4
Diet 3	0.12	0.57	3.3

Excess Lifetime Risk [ ]			
Diet 1	6.8E-07	2.1E-05	5.0E-04
Diet 2	3.2E-07	9.4E-06	2.2E-04
Diet 3	1.9E-07	5.2E-06	1.2E-04
Diet 4	2.1E-06	5.9E-05	1.6E-03

Relative Risk [ ]			
Diet 1	1.00063	1.015	1.3
Diet 2	1.00031	1.0064	1.12
Diet 3	1.00019	1.0033	1.068
Diet 4	1.002	1.044	1.85

Probability of Causation [%]			
Diet 1	0.063	1.44	22.8
Diet 2	0.031	0.63	10.6
Diet 3	0.019	0.33	6.4
Diet 4	0.196	4.23	45.9

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.23	1.3	6.5
Commercial Milk (locally produced)	0.06	0.36	2.4
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.6	3.9	26
Beef (locally produced)	0.00055	0.0092	0.19
Leafy Vegetables (locally produced)	0.00024	0.0022	0.019
Eggs (locally produced)	0.016	0.098	0.61
Cottage Cheese (locally produced)	0.00049	0.0047	0.049
Inhalation	0.012	0.04	0.15
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.29	1.4	7.4
Diet 2	0.11	0.54	3.2
Diet 3	0.098	0.47	2.7

Excess Lifetime Risk [ ]			
Diet 1	4.0E-06	4.8E-05	5.9E-04
Diet 2	1.8E-06	2.0E-05	2.5E-04
Diet 3	1.6E-06	1.8E-05	1.9E-04
Diet 4	1.2E-05	1.6E-04	2.1E-03

Relative Risk [ ]			
Diet 1	1.0014	1.011	1.13
Diet 2	1.0006	1.0052	1.06
Diet 3	1.00055	1.0049	1.049
Diet 4	1.0042	1.037	1.41

Probability of Causation [%]			
Diet 1	0.139	1.13	11.4
Diet 2	0.060	0.51	5.7
Diet 3	0.055	0.48	4.7
Diet 4	0.415	3.60	29.1

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	1.5	8
Commercial Milk (locally produced)	0.066	0.4	2.8
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	0.66	4.6	31
Beef (locally produced)	0.00076	0.013	0.24
Leafy Vegetables (locally produced)	0.00023	0.0023	0.019
Eggs (locally produced)	0.018	0.12	0.75
Cottage Cheese (locally produced)	0.0005	0.0047	0.046
Inhalation	0.013	0.042	0.16
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.33	1.7	9
Diet 2	0.13	0.6	3.7
Diet 3	0.1	0.52	3.2

Excess Lifetime Risk [ ]			
Diet 1	3.4E-07	1.2E-05	2.9E-04
Diet 2	1.4E-07	5.4E-06	1.2E-04
Diet 3	1.8E-07	4.8E-06	1.2E-04
Diet 4	1.1E-06	3.4E-05	9.0E-04

Relative Risk [ ]			
Diet 1	1.00041	1.0084	1.16
Diet 2	1.00018	1.0037	1.071
Diet 3	1.00017	1.0031	1.065
Diet 4	1.0013	1.026	1.51

Probability of Causation [%]			
Diet 1	0.041	0.84	14.2
Diet 2	0.018	0.37	6.6
Diet 3	0.017	0.31	6.1
Diet 4	0.128	2.57	33.8

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.53	3	18
Commercial Milk (locally produced)	0.14	0.87	5.7
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	1.4	9.1	59
Beef (locally produced)	0.0012	0.022	0.48
Leafy Vegetables (locally produced)	0.00055	0.0053	0.045
Eggs (locally produced)	0.034	0.23	1.5
Cottage Cheese (locally produced)	0.0012	0.011	0.12
Inhalation	0.03	0.1	0.35
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.64	3.5	20
Diet 2	0.27	1.3	7.3
Diet 3	0.12	0.54	2.9

Excess Lifetime Risk [ ]			
Diet 1	8.4E-06	1.1E-04	1.5E-03
Diet 2	4.5E-06	4.9E-05	5.7E-04
Diet 3	2.0E-06	2.1E-05	2.1E-04
Diet 4	2.9E-05	3.9E-04	5.3E-03

Relative Risk [ ]			
Diet 1	1.0035	1.029	1.26
Diet 2	1.0014	1.013	1.13
Diet 3	1.00068	1.0054	1.052
Diet 4	1.01	1.087	2.1

Probability of Causation [%]			
Diet 1	0.347	2.79	20.8
Diet 2	0.136	1.27	11.1
Diet 3	0.068	0.54	4.9
Diet 4	1.016	7.97	51.7

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.68	3.5	20
Commercial Milk (locally produced)	0.16	0.97	6.7
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	1.6	11	70
Beef (locally produced)	0.0017	0.031	0.67
Leafy Vegetables (locally produced)	0.00052	0.0052	0.044
Eggs (locally produced)	0.039	0.27	1.8
Cottage Cheese (locally produced)	0.0012	0.012	0.14
Inhalation	0.031	0.11	0.37
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.8	4	22
Diet 2	0.29	1.5	8.6
Diet 3	0.13	0.6	3.4

Excess Lifetime Risk [ ]			
Diet 1	9.7E-07	3.0E-05	7.3E-04
Diet 2	4.1E-07	1.3E-05	3.1E-04
Diet 3	2.0E-07	5.5E-06	1.3E-04
Diet 4	3.0E-06	8.3E-05	2.2E-03

Relative Risk [ ]			
Diet 1	1.0009	1.021	1.43
Diet 2	1.00043	1.0089	1.17
Diet 3	1.0002	1.0034	1.071
Diet 4	1.0027	1.06	2.3

Probability of Causation [%]			
Diet 1	0.090	2.01	29.9
Diet 2	0.043	0.88	14.8
Diet 3	0.020	0.34	6.6
Diet 4	0.270	5.68	55.9

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.12	0.71	4.4
Commercial Milk (locally produced)	0.032	0.21	1.4
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.28	2.2	15
Beef (locally produced)	0.00031	0.0051	0.11
Leafy Vegetables (locally produced)	0.00012	0.0013	0.011
Eggs (locally produced)	0.0074	0.055	0.38
Cottage Cheese (locally produced)	0.00028	0.0027	0.032
Inhalation	0.0066	0.023	0.087
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.14	0.82	5
Diet 2	0.058	0.31	1.8
Diet 3	0.087	0.45	2.7

Excess Lifetime Risk [ ]			
Diet 1	1.9E-06	2.8E-05	3.3E-04
Diet 2	9.8E-07	1.2E-05	1.4E-04
Diet 3	1.5E-06	1.8E-05	1.9E-04
Diet 4	6.0E-06	9.1E-05	1.2E-03

Relative Risk [ ]			
Diet 1	1.00073	1.0065	1.07
Diet 2	1.0003	1.003	1.032
Diet 3	1.00053	1.0047	1.048
Diet 4	1.0021	1.021	1.25

Probability of Causation [%]			
Diet 1	0.073	0.65	6.5
Diet 2	0.030	0.30	3.1
Diet 3	0.053	0.47	4.6
Diet 4	0.210	2.04	20.1

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.14	0.83	5
Commercial Milk (locally produced)	0.034	0.23	1.6
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	0.33	2.6	17
Beef (locally produced)	0.00043	0.007	0.15
Leafy Vegetables (locally produced)	0.00011	0.0013	0.011
Eggs (locally produced)	0.0089	0.066	0.45
Cottage Cheese (locally produced)	0.00026	0.0027	0.03
Inhalation	0.0068	0.025	0.091
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.17	0.95	5.6
Diet 2	0.067	0.36	2.1
Diet 3	0.096	0.5	3.1

Excess Lifetime Risk [ ]			
Diet 1	1.9E-07	7.2E-06	1.8E-04
Diet 2	8.7E-08	3.2E-06	7.7E-05
Diet 3	1.7E-07	4.7E-06	1.2E-04
Diet 4	6.3E-07	2.0E-05	5.8E-04

Relative Risk [ ]			
Diet 1	1.00023	1.0049	1.094
Diet 2	1.00011	1.0021	1.041
Diet 3	1.00016	1.0031	1.064
Diet 4	1.00065	1.015	1.3

Probability of Causation [%]			
Diet 1	0.023	0.49	8.5
Diet 2	0.011	0.21	3.9
Diet 3	0.016	0.30	6.0
Diet 4	0.065	1.48	22.9

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.44	2.5	15
Commercial Milk (locally produced)	0.12	0.72	4.6
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	1.2	7.6	48
Beef (locally produced)	0.001	0.018	0.39
Leafy Vegetables (locally produced)	0.00045	0.0044	0.038
Eggs (locally produced)	0.029	0.19	1.2
Cottage Cheese (locally produced)	0.00097	0.0095	0.098
Inhalation	0.025	0.083	0.29
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.54	2.9	17
Diet 2	0.23	1.1	6
Diet 3	0.11	0.52	2.9

Excess Lifetime Risk [ ]			
Diet 1	7.1E-06	9.6E-05	1.2E-03
Diet 2	3.8E-06	4.1E-05	5.0E-04
Diet 3	1.9E-06	2.0E-05	2.0E-04
Diet 4	2.4E-05	3.2E-04	4.5E-03

Relative Risk [ ]			
Diet 1	1.0028	1.024	1.22
Diet 2	1.0012	1.011	1.11
Diet 3	1.00065	1.0052	1.051
Diet 4	1.0088	1.073	1.9

Probability of Causation [%]			
Diet 1	0.283	2.30	18.2
Diet 2	0.117	1.08	9.6
Diet 3	0.065	0.52	4.9
Diet 4	0.876	6.82	47.3

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.57	2.9	17
Commercial Milk (locally produced)	0.13	0.8	5.6
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	1.4	9.1	58
Beef (locally produced)	0.0015	0.025	0.55
Leafy Vegetables (locally produced)	0.00043	0.0043	0.038
Eggs (locally produced)	0.032	0.23	1.5
Cottage Cheese (locally produced)	0.00097	0.0098	0.11
Inhalation	0.026	0.091	0.3
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.67	3.3	19
Diet 2	0.25	1.2	7.2
Diet 3	0.12	0.58	3.4

Excess Lifetime Risk [ ]			
Diet 1	8.1E-07	2.5E-05	6.1E-04
Diet 2	3.5E-07	1.1E-05	2.5E-04
Diet 3	2.0E-07	5.3E-06	1.3E-04
Diet 4	2.5E-06	6.9E-05	1.8E-03

Relative Risk [ ]			
Diet 1	1.00074	1.017	1.36
Diet 2	1.00036	1.0074	1.14
Diet 3	1.00019	1.0033	1.069
Diet 4	1.0022	1.052	2.1

Probability of Causation [%]			
Diet 1	0.074	1.68	26.2
Diet 2	0.036	0.74	12.4
Diet 3	0.019	0.33	6.4
Diet 4	0.224	4.93	51.2

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.2	1.2	6.7
Commercial Milk (locally produced)	0.056	0.35	2.2
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.52	3.7	26
Beef (locally produced)	0.0005	0.0087	0.17
Leafy Vegetables (locally produced)	0.00022	0.0022	0.018
Eggs (locally produced)	0.015	0.095	0.6
Cottage Cheese (locally produced)	0.00045	0.0046	0.048
Inhalation	0.012	0.04	0.14
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.26	1.4	7.6
Diet 2	0.1	0.53	2.8
Diet 3	0.096	0.47	2.7

Excess Lifetime Risk [ ]			
Diet 1	3.6E-06	4.6E-05	5.6E-04
Diet 2	1.7E-06	2.0E-05	2.3E-04
Diet 3	1.5E-06	1.9E-05	1.9E-04
Diet 4	1.1E-05	1.5E-04	2.1E-03

Relative Risk [ ]			
Diet 1	1.0014	1.011	1.12
Diet 2	1.00057	1.0053	1.055
Diet 3	1.00056	1.0048	1.049
Diet 4	1.0039	1.036	1.43

Probability of Causation [%]			
Diet 1	0.138	1.09	10.7
Diet 2	0.057	0.52	5.2
Diet 3	0.056	0.48	4.7
Diet 4	0.390	3.48	29.6

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.26	1.4	7.4
Commercial Milk (locally produced)	0.065	0.39	2.5
Commercial Milk (regionally mixed)	0.078	0.47	3.1
Goat Milk (locally produced)	0.58	4.4	30
Beef (locally produced)	0.00073	0.012	0.23
Leafy Vegetables (locally produced)	0.0002	0.0022	0.018
Eggs (locally produced)	0.017	0.11	0.72
Cottage Cheese (locally produced)	0.00048	0.0046	0.044
Inhalation	0.012	0.043	0.16
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.31	1.6	8.4
Diet 2	0.12	0.59	3.2
Diet 3	0.1	0.52	3.2

Excess Lifetime Risk [ ]			
Diet 1	3.6E-07	1.2E-05	2.7E-04
Diet 2	1.4E-07	5.2E-06	1.2E-04
Diet 3	1.8E-07	4.8E-06	1.2E-04
Diet 4	1.1E-06	3.3E-05	9.2E-04

Relative Risk [ ]			
Diet 1	1.00037	1.0082	1.16
Diet 2	1.00017	1.0035	1.069
Diet 3	1.00017	1.0031	1.065
Diet 4	1.0011	1.025	1.47

Probability of Causation [%]			
Diet 1	0.037	0.82	13.9
Diet 2	0.017	0.35	6.4
Diet 3	0.017	0.31	6.1
Diet 4	0.114	2.44	31.5

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.34	2	11
Commercial Milk (locally produced)	0.089	0.56	3.5
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.89	6	39
Beef (locally produced)	0.0008	0.014	0.28
Leafy Vegetables (locally produced)	0.00035	0.0035	0.028
Eggs (locally produced)	0.022	0.15	0.97
Cottage Cheese (locally produced)	0.00077	0.0073	0.079
Inhalation	0.02	0.064	0.23
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.41	2.3	13
Diet 2	0.17	0.84	4.6
Diet 3	0.11	0.5	2.8

Excess Lifetime Risk [ ]			
Diet 1	5.3E-06	7.6E-05	9.3E-04
Diet 2	2.8E-06	3.1E-05	3.6E-04
Diet 3	1.8E-06	1.9E-05	2.0E-04
Diet 4	1.8E-05	2.5E-04	3.3E-03

Relative Risk [ ]			
Diet 1	1.0021	1.018	1.18
Diet 2	1.00088	1.0084	1.081
Diet 3	1.00062	1.005	1.05
Diet 4	1.0064	1.057	1.67

Probability of Causation [%]			
Diet 1	0.214	1.81	15.0
Diet 2	0.088	0.84	7.5
Diet 3	0.062	0.50	4.8
Diet 4	0.639	5.40	39.6

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.43	2.3	13
Commercial Milk (locally produced)	0.1	0.62	4.1
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	1	7	45
Beef (locally produced)	0.0011	0.019	0.41
Leafy Vegetables (locally produced)	0.00034	0.0034	0.028
Eggs (locally produced)	0.026	0.18	1.2
Cottage Cheese (locally produced)	0.00076	0.0074	0.081
Inhalation	0.02	0.069	0.24
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.5	2.6	15
Diet 2	0.19	0.98	5.2
Diet 3	0.11	0.55	3.3

Excess Lifetime Risk [ ]			
Diet 1	6.5E-07	2.0E-05	4.5E-04
Diet 2	2.6E-07	8.6E-06	2.0E-04
Diet 3	1.9E-07	5.1E-06	1.2E-04
Diet 4	1.8E-06	5.4E-05	1.4E-03

Relative Risk [ ]			
Diet 1	1.00057	1.013	1.27
Diet 2	1.00031	1.0058	1.11
Diet 3	1.00018	1.0032	1.067
Diet 4	1.0018	1.041	1.79

Probability of Causation [%]			
Diet 1	0.057	1.28	21.0
Diet 2	0.031	0.58	9.7
Diet 3	0.018	0.32	6.3
Diet 4	0.183	3.90	43.6

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.17	1.1	6.6
Commercial Milk (locally produced)	0.052	0.33	1.9
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.51	3.4	26
Beef (locally produced)	0.00045	0.008	0.17
Leafy Vegetables (locally produced)	0.00018	0.002	0.017
Eggs (locally produced)	0.013	0.086	0.61
Cottage Cheese (locally produced)	0.00042	0.0042	0.042
Inhalation	0.012	0.044	0.17
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.23	1.3	7.5
Diet 2	0.092	0.5	2.5
Diet 3	0.096	0.47	2.7

Excess Lifetime Risk [ ]			
Diet 1	3.4E-06	4.2E-05	5.1E-04
Diet 2	1.6E-06	1.8E-05	2.0E-04
Diet 3	1.6E-06	1.9E-05	2.0E-04
Diet 4	9.7E-06	1.4E-04	1.9E-03

Relative Risk [ ]			
Diet 1	1.0012	1.011	1.1
Diet 2	1.00054	1.0048	1.047
Diet 3	1.00057	1.0049	1.049
Diet 4	1.0035	1.034	1.41

Probability of Causation [%]			
Diet 1	0.118	1.04	9.2
Diet 2	0.054	0.47	4.5
Diet 3	0.057	0.49	4.7
Diet 4	0.347	3.25	29.2

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.24	1.3	6.8
Commercial Milk (locally produced)	0.059	0.36	2.1
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	0.58	4	28
Beef (locally produced)	0.00066	0.011	0.25
Leafy Vegetables (locally produced)	0.00017	0.002	0.016
Eggs (locally produced)	0.014	0.1	0.7
Cottage Cheese (locally produced)	0.0004	0.0043	0.044
Inhalation	0.012	0.047	0.16
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.29	1.4	7.8
Diet 2	0.1	0.57	2.9
Diet 3	0.1	0.52	3.2

Excess Lifetime Risk [ ]			
Diet 1	3.2E-07	1.1E-05	2.8E-04
Diet 2	1.6E-07	4.7E-06	1.2E-04
Diet 3	1.8E-07	4.9E-06	1.2E-04
Diet 4	1.1E-06	3.0E-05	9.0E-04

Relative Risk [ ]			
Diet 1	1.00036	1.0074	1.15
Diet 2	1.00017	1.0033	1.064
Diet 3	1.00018	1.0031	1.065
Diet 4	1.001	1.023	1.45

Probability of Causation [%]			
Diet 1	0.036	0.74	13.1
Diet 2	0.016	0.33	6.0
Diet 3	0.018	0.31	6.1
Diet 4	0.100	2.25	31.0

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.04	0.31	1.7
Commercial Milk (locally produced)	0.012	0.086	0.57
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.13	0.98	7.1
Beef (locally produced)	0.00013	0.0021	0.051
Leafy Vegetables (locally produced)	0.000048	0.00054	0.0055
Eggs (locally produced)	0.0033	0.023	0.17
Cottage Cheese (locally produced)	0.00009	0.0012	0.012
Inhalation	0.0027	0.01	0.043
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.053	0.36	1.9
Diet 2	0.023	0.13	0.79
Diet 3	0.077	0.44	2.6

Excess Lifetime Risk [ ]			
Diet 1	7.7E-07	1.1E-05	1.4E-04
Diet 2	4.3E-07	5.0E-06	6.5E-05
Diet 3	1.4E-06	1.7E-05	1.9E-04
Diet 4	2.6E-06	3.7E-05	5.1E-04

Relative Risk [ ]			
Diet 1	1.0003	1.0028	1.036
Diet 2	1.00015	1.0013	1.018
Diet 3	1.00051	1.0046	1.048
Diet 4	1.00098	1.0091	1.11

Probability of Causation [%]			
Diet 1	0.030	0.28	3.5
Diet 2	0.015	0.13	1.8
Diet 3	0.051	0.45	4.6
Diet 4	0.098	0.91	10.0

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**  
**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.052	0.35	2
Commercial Milk (locally produced)	0.015	0.1	0.7
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	0.15	1.1	8
Beef (locally produced)	0.0002	0.003	0.075
Leafy Vegetables (locally produced)	0.000046	0.00054	0.005
Eggs (locally produced)	0.0036	0.027	0.2
Cottage Cheese (locally produced)	0.0001	0.0012	0.012
Inhalation	0.0029	0.011	0.045
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.062	0.4	2.2
Diet 2	0.026	0.15	0.98
Diet 3	0.084	0.49	3.1

Excess Lifetime Risk [ ]			
Diet 1	7.9E-08	3.0E-06	8.0E-05
Diet 2	4.1E-08	1.4E-06	3.1E-05
Diet 3	1.6E-07	4.6E-06	1.1E-04
Diet 4	2.6E-07	8.7E-06	2.4E-04

Relative Risk [ ]			
Diet 1	1.000085	1.0021	1.043
Diet 2	1.000042	1.00096	1.019
Diet 3	1.00015	1.003	1.063
Diet 4	1.00022	1.006	1.15

Probability of Causation [%]			
Diet 1	0.008	0.21	4.2
Diet 2	0.004	0.10	1.8
Diet 3	0.015	0.30	6.0
Diet 4	0.022	0.60	13.1

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.23	1.3	7.4
Commercial Milk (locally produced)	0.058	0.38	2.3
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.61	4	27
Beef (locally produced)	0.00054	0.0089	0.19
Leafy Vegetables (locally produced)	0.00021	0.0022	0.02
Eggs (locally produced)	0.015	0.099	0.62
Cottage Cheese (locally produced)	0.00045	0.0049	0.049
Inhalation	0.013	0.045	0.16
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.28	1.5	8.3
Diet 2	0.11	0.56	3.1
Diet 3	0.097	0.48	2.8

Excess Lifetime Risk [ ]			
Diet 1	3.8E-06	4.8E-05	5.9E-04
Diet 2	1.8E-06	2.1E-05	2.4E-04
Diet 3	1.6E-06	1.9E-05	2.0E-04
Diet 4	1.2E-05	1.6E-04	1.8E-03

Relative Risk [ ]			
Diet 1	1.0014	1.012	1.12
Diet 2	1.00062	1.0053	1.055
Diet 3	1.00058	1.0049	1.049
Diet 4	1.0044	1.037	1.48

Probability of Causation [%]			
Diet 1	0.144	1.15	10.4
Diet 2	0.062	0.53	5.2
Diet 3	0.058	0.49	4.7
Diet 4	0.434	3.58	31.4

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	1.5	8.5
Commercial Milk (locally produced)	0.07	0.41	2.8
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	0.69	4.7	29
Beef (locally produced)	0.00083	0.013	0.29
Leafy Vegetables (locally produced)	0.00021	0.0022	0.02
Eggs (locally produced)	0.017	0.12	0.76
Cottage Cheese (locally produced)	0.00049	0.0049	0.053
Inhalation	0.013	0.049	0.17
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.33	1.7	9.6
Diet 2	0.13	0.64	3.8
Diet 3	0.1	0.53	3.2

Excess Lifetime Risk [ ]			
Diet 1	4.0E-07	1.2E-05	2.9E-04
Diet 2	1.9E-07	5.5E-06	1.3E-04
Diet 3	1.8E-07	4.9E-06	1.2E-04
Diet 4	1.3E-06	3.3E-05	9.7E-04

Relative Risk [ ]			
Diet 1	1.00039	1.0086	1.18
Diet 2	1.00019	1.0038	1.071
Diet 3	1.00018	1.0031	1.065
Diet 4	1.0011	1.026	1.56

Probability of Causation [%]			
Diet 1	0.039	0.85	14.9
Diet 2	0.019	0.38	6.6
Diet 3	0.018	0.31	6.1
Diet 4	0.112	2.50	35.1

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.19	1.2	6.3
Commercial Milk (locally produced)	0.052	0.34	2.1
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.5	3.6	26
Beef (locally produced)	0.0005	0.0083	0.16
Leafy Vegetables (locally produced)	0.0002	0.0021	0.018
Eggs (locally produced)	0.014	0.088	0.61
Cottage Cheese (locally produced)	0.00041	0.0045	0.046
Inhalation	0.013	0.045	0.17
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.24	1.4	7.1
Diet 2	0.098	0.52	2.9
Diet 3	0.098	0.48	2.8

Excess Lifetime Risk [ ]			
Diet 1	3.4E-06	4.3E-05	5.5E-04
Diet 2	1.7E-06	1.9E-05	2.2E-04
Diet 3	1.6E-06	1.9E-05	2.0E-04
Diet 4	1.0E-05	1.4E-04	2.0E-03

Relative Risk [ ]			
Diet 1	1.0013	1.011	1.11
Diet 2	1.00059	1.005	1.056
Diet 3	1.00057	1.0049	1.05
Diet 4	1.0038	1.035	1.41

Probability of Causation [%]			
Diet 1	0.133	1.06	10.3
Diet 2	0.059	0.49	5.3
Diet 3	0.057	0.49	4.7
Diet 4	0.381	3.34	28.9

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.24	1.4	7.1
Commercial Milk (locally produced)	0.061	0.38	2.5
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	0.57	4.2	29
Beef (locally produced)	0.00075	0.012	0.24
Leafy Vegetables (locally produced)	0.0002	0.0021	0.017
Eggs (locally produced)	0.016	0.11	0.73
Cottage Cheese (locally produced)	0.00045	0.0046	0.044
Inhalation	0.014	0.049	0.18
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.3	1.6	8.1
Diet 2	0.11	0.58	3.3
Diet 3	0.1	0.53	3.2

Excess Lifetime Risk [ ]			
Diet 1	3.5E-07	1.2E-05	2.7E-04
Diet 2	1.6E-07	5.2E-06	1.2E-04
Diet 3	1.8E-07	4.9E-06	1.2E-04
Diet 4	1.1E-06	3.2E-05	9.7E-04

Relative Risk [ ]			
Diet 1	1.00034	1.0078	1.15
Diet 2	1.00017	1.0036	1.067
Diet 3	1.00018	1.0031	1.065
Diet 4	1.001	1.024	1.47

Probability of Causation [%]			
Diet 1	0.034	0.78	13.1
Diet 2	0.017	0.35	6.2
Diet 3	0.018	0.31	6.1
Diet 4	0.103	2.32	31.5

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.22	1.3	7.6
Commercial Milk (locally produced)	0.058	0.39	2.3
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.6	4.2	27
Beef (locally produced)	0.00057	0.0095	0.19
Leafy Vegetables (locally produced)	0.00022	0.0023	0.021
Eggs (locally produced)	0.015	0.1	0.71
Cottage Cheese (locally produced)	0.00046	0.005	0.051
Inhalation	0.016	0.052	0.2
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.28	1.5	8.4
Diet 2	0.11	0.59	3.2
Diet 3	0.1	0.48	2.8

Excess Lifetime Risk [ ]			
Diet 1	3.9E-06	5.1E-05	6.1E-04
Diet 2	1.9E-06	2.2E-05	2.6E-04
Diet 3	1.6E-06	1.9E-05	2.0E-04
Diet 4	1.2E-05	1.6E-04	2.1E-03

Relative Risk [ ]			
Diet 1	1.0015	1.012	1.13
Diet 2	1.00067	1.0055	1.058
Diet 3	1.00059	1.005	1.05
Diet 4	1.0045	1.039	1.48

Probability of Causation [%]			
Diet 1	0.149	1.22	11.1
Diet 2	0.067	0.54	5.5
Diet 3	0.059	0.49	4.8
Diet 4	0.452	3.79	32.5

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.29	1.5	8.5
Commercial Milk (locally produced)	0.071	0.42	2.7
Commercial Milk (regionally mixed)	0.078	0.47	3.1
Goat Milk (locally produced)	0.69	4.7	32
Beef (locally produced)	0.00084	0.013	0.28
Leafy Vegetables (locally produced)	0.00022	0.0023	0.02
Eggs (locally produced)	0.017	0.12	0.82
Cottage Cheese (locally produced)	0.00047	0.0052	0.052
Inhalation	0.016	0.057	0.21
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.35	1.8	9.5
Diet 2	0.13	0.67	3.7
Diet 3	0.11	0.54	3.3

Excess Lifetime Risk [ ]			
Diet 1	4.3E-07	1.3E-05	3.3E-04
Diet 2	1.9E-07	5.9E-06	1.4E-04
Diet 3	1.8E-07	5.0E-06	1.2E-04
Diet 4	1.4E-06	3.6E-05	1.1E-03

Relative Risk [ ]			
Diet 1	1.00041	1.0091	1.19
Diet 2	1.0002	1.0041	1.075
Diet 3	1.00018	1.0032	1.066
Diet 4	1.0012	1.026	1.58

Probability of Causation [%]			
Diet 1	0.041	0.90	16.2
Diet 2	0.020	0.41	7.0
Diet 3	0.018	0.31	6.2
Diet 4	0.121	2.54	36.5

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.12	0.71	4.6
Commercial Milk (locally produced)	0.031	0.22	1.4
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.3	2.3	15
Beef (locally produced)	0.00033	0.0052	0.11
Leafy Vegetables (locally produced)	0.00012	0.0013	0.012
Eggs (locally produced)	0.0086	0.057	0.41
Cottage Cheese (locally produced)	0.00025	0.0027	0.035
Inhalation	0.0088	0.03	0.11
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.15	0.82	5.2
Diet 2	0.068	0.32	2
Diet 3	0.09	0.46	2.7

Excess Lifetime Risk [ ]			
Diet 1	2.2E-06	2.8E-05	4.0E-04
Diet 2	1.2E-06	1.3E-05	1.5E-04
Diet 3	1.6E-06	1.8E-05	1.9E-04
Diet 4	7.1E-06	8.5E-05	1.2E-03

Relative Risk [ ]			
Diet 1	1.00084	1.0067	1.074
Diet 2	1.00039	1.003	1.032
Diet 3	1.00056	1.0047	1.049
Diet 4	1.0025	1.021	1.28

Probability of Causation [%]			
Diet 1	0.084	0.67	6.9
Diet 2	0.039	0.30	3.1
Diet 3	0.056	0.47	4.7
Diet 4	0.246	2.08	21.7

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.16	0.83	5.3
Commercial Milk (locally produced)	0.038	0.23	1.7
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	0.34	2.7	18
Beef (locally produced)	0.00046	0.0073	0.15
Leafy Vegetables (locally produced)	0.00013	0.0013	0.012
Eggs (locally produced)	0.0096	0.066	0.45
Cottage Cheese (locally produced)	0.00028	0.0027	0.035
Inhalation	0.0098	0.032	0.13
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.19	0.97	6
Diet 2	0.075	0.37	2.3
Diet 3	0.097	0.51	3.2

Excess Lifetime Risk [ ]			
Diet 1	2.3E-07	6.9E-06	1.8E-04
Diet 2	1.1E-07	3.3E-06	7.7E-05
Diet 3	1.8E-07	4.8E-06	1.2E-04
Diet 4	7.2E-07	1.9E-05	5.5E-04

Relative Risk [ ]			
Diet 1	1.00023	1.0051	1.11
Diet 2	1.0001	1.0023	1.041
Diet 3	1.00017	1.0031	1.064
Diet 4	1.00064	1.015	1.29

Probability of Causation [%]			
Diet 1	0.023	0.51	9.9
Diet 2	0.010	0.23	4.0
Diet 3	0.017	0.31	6.0
Diet 4	0.064	1.51	22.7

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.2	1.2	6.7
Commercial Milk (locally produced)	0.052	0.33	2
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.54	3.6	22
Beef (locally produced)	0.00049	0.0082	0.16
Leafy Vegetables (locally produced)	0.00019	0.0021	0.017
Eggs (locally produced)	0.013	0.089	0.56
Cottage Cheese (locally produced)	0.00043	0.0043	0.048
Inhalation	0.014	0.045	0.16
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.24	1.3	7.7
Diet 2	0.11	0.51	2.7
Diet 3	0.099	0.47	2.8

Excess Lifetime Risk [ ]			
Diet 1	3.3E-06	4.3E-05	5.5E-04
Diet 2	1.8E-06	1.9E-05	2.2E-04
Diet 3	1.7E-06	1.9E-05	2.0E-04
Diet 4	1.1E-05	1.5E-04	2.0E-03

Relative Risk [ ]			
Diet 1	1.0012	1.01	1.1
Diet 2	1.00059	1.0048	1.05
Diet 3	1.00058	1.0049	1.05
Diet 4	1.0039	1.034	1.4

Probability of Causation [%]			
Diet 1	0.125	1.03	9.5
Diet 2	0.059	0.48	4.8
Diet 3	0.058	0.49	4.7
Diet 4	0.386	3.29	28.2

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.26	1.3	7.5
Commercial Milk (locally produced)	0.059	0.37	2.5
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	0.6	4.2	27
Beef (locally produced)	0.00071	0.011	0.23
Leafy Vegetables (locally produced)	0.0002	0.002	0.017
Eggs (locally produced)	0.015	0.11	0.68
Cottage Cheese (locally produced)	0.00041	0.0045	0.048
Inhalation	0.015	0.048	0.18
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.31	1.5	8.5
Diet 2	0.12	0.58	3.2
Diet 3	0.11	0.53	3.2

Excess Lifetime Risk [ ]			
Diet 1	3.6E-07	1.2E-05	2.7E-04
Diet 2	1.7E-07	5.0E-06	1.2E-04
Diet 3	1.8E-07	4.9E-06	1.2E-04
Diet 4	1.1E-06	3.1E-05	8.5E-04

Relative Risk [ ]			
Diet 1	1.00035	1.0079	1.16
Diet 2	1.00018	1.0036	1.063
Diet 3	1.00017	1.0031	1.066
Diet 4	1.00098	1.025	1.47

Probability of Causation [%]			
Diet 1	0.035	0.79	13.7
Diet 2	0.018	0.35	6.0
Diet 3	0.017	0.31	6.2
Diet 4	0.098	2.41	31.7

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.11	0.69	3.5
Commercial Milk (locally produced)	0.034	0.2	1.2
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.34	2.2	14
Beef (locally produced)	0.00029	0.005	0.11
Leafy Vegetables (locally produced)	0.00012	0.0013	0.011
Eggs (locally produced)	0.008	0.052	0.32
Cottage Cheese (locally produced)	0.00026	0.0027	0.028
Inhalation	0.0071	0.025	0.092
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.14	0.8	4
Diet 2	0.062	0.3	1.7
Diet 3	0.087	0.45	2.7

Excess Lifetime Risk [ ]			
Diet 1	2.0E-06	2.5E-05	3.2E-04
Diet 2	1.1E-06	1.2E-05	1.3E-04
Diet 3	1.5E-06	1.8E-05	1.9E-04
Diet 4	6.5E-06	8.7E-05	1.3E-03

Relative Risk [ ]			
Diet 1	1.00074	1.0066	1.068
Diet 2	1.00033	1.003	1.034
Diet 3	1.00054	1.0047	1.048
Diet 4	1.0024	1.021	1.24

Probability of Causation [%]			
Diet 1	0.074	0.66	6.3
Diet 2	0.033	0.30	3.3
Diet 3	0.054	0.47	4.6
Diet 4	0.244	2.05	19.1

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.15	0.8	4.3
Commercial Milk (locally produced)	0.038	0.22	1.5
Commercial Milk (regionally mixed)	0.078	0.47	3.1
Goat Milk (locally produced)	0.4	2.6	17
Beef (locally produced)	0.00043	0.007	0.16
Leafy Vegetables (locally produced)	0.00012	0.0013	0.01
Eggs (locally produced)	0.0087	0.062	0.41
Cottage Cheese (locally produced)	0.00028	0.0027	0.029
Inhalation	0.0076	0.027	0.097
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.18	0.92	4.8
Diet 2	0.069	0.34	2
Diet 3	0.094	0.51	3.1

Excess Lifetime Risk [ ]			
Diet 1	2.1E-07	6.8E-06	1.7E-04
Diet 2	1.0E-07	3.1E-06	7.3E-05
Diet 3	1.7E-07	4.7E-06	1.2E-04
Diet 4	7.1E-07	2.0E-05	5.3E-04

Relative Risk [ ]			
Diet 1	1.0002	1.0047	1.096
Diet 2	1.000094	1.0021	1.039
Diet 3	1.00017	1.0031	1.064
Diet 4	1.00056	1.014	1.3

Probability of Causation [%]			
Diet 1	0.020	0.47	8.7
Diet 2	0.009	0.21	3.7
Diet 3	0.016	0.31	6.0
Diet 4	0.056	1.40	23.2

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**

**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.13	0.88	4.9
Commercial Milk (locally produced)	0.038	0.26	1.6
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.34	2.5	20
Beef (locally produced)	0.00036	0.0061	0.11
Leafy Vegetables (locally produced)	0.00015	0.0015	0.013
Eggs (locally produced)	0.01	0.066	0.42
Cottage Cheese (locally produced)	0.00032	0.0034	0.034
Inhalation	0.01	0.036	0.13
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.17	1	5.6
Diet 2	0.071	0.4	2.1
Diet 3	0.093	0.47	2.8

Excess Lifetime Risk [ ]			
Diet 1	2.6E-06	3.2E-05	4.1E-04
Diet 2	1.3E-06	1.4E-05	1.6E-04
Diet 3	1.5E-06	1.9E-05	1.9E-04
Diet 4	7.4E-06	1.1E-04	1.5E-03

Relative Risk [ ]			
Diet 1	1.001	1.0077	1.08
Diet 2	1.00046	1.0037	1.04
Diet 3	1.00056	1.0048	1.049
Diet 4	1.0027	1.026	1.31

Probability of Causation [%]			
Diet 1	0.103	0.76	7.4
Diet 2	0.046	0.37	3.8
Diet 3	0.056	0.48	4.7
Diet 4	0.267	2.52	23.9

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.17	1	5.1
Commercial Milk (locally produced)	0.045	0.29	1.8
Commercial Milk (regionally mixed)	0.078	0.47	3.1
Goat Milk (locally produced)	0.37	3.1	23
Beef (locally produced)	0.00053	0.0085	0.16
Leafy Vegetables (locally produced)	0.00014	0.0016	0.013
Eggs (locally produced)	0.012	0.079	0.54
Cottage Cheese (locally produced)	0.00033	0.0034	0.032
Inhalation	0.01	0.039	0.14
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.21	1.2	5.8
Diet 2	0.084	0.44	2.3
Diet 3	0.097	0.52	3.2

Excess Lifetime Risk [ ]			
Diet 1	2.7E-07	8.7E-06	1.9E-04
Diet 2	1.1E-07	3.8E-06	8.7E-05
Diet 3	1.8E-07	4.8E-06	1.2E-04
Diet 4	8.3E-07	2.3E-05	7.3E-04

Relative Risk [ ]			
Diet 1	1.00025	1.006	1.11
Diet 2	1.00012	1.0026	1.047
Diet 3	1.00017	1.0031	1.064
Diet 4	1.00079	1.018	1.31

Probability of Causation [%]			
Diet 1	0.025	0.60	9.8
Diet 2	0.012	0.26	4.5
Diet 3	0.017	0.31	6.1
Diet 4	0.078	1.75	23.8

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.24	1.5	8.4
Commercial Milk (locally produced)	0.069	0.43	2.6
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.69	4.5	28
Beef (locally produced)	0.00061	0.01	0.2
Leafy Vegetables (locally produced)	0.00027	0.0026	0.022
Eggs (locally produced)	0.016	0.11	0.76
Cottage Cheese (locally produced)	0.00057	0.0055	0.059
Inhalation	0.017	0.056	0.21
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.3	1.7	9.7
Diet 2	0.13	0.66	3.5
Diet 3	0.1	0.49	2.8

Excess Lifetime Risk [ ]			
Diet 1	4.1E-06	5.5E-05	6.7E-04
Diet 2	2.0E-06	2.4E-05	2.8E-04
Diet 3	1.7E-06	1.9E-05	2.0E-04
Diet 4	1.3E-05	1.8E-04	2.5E-03

Relative Risk [ ]			
Diet 1	1.0016	1.014	1.13
Diet 2	1.00074	1.0062	1.061
Diet 3	1.00061	1.005	1.05
Diet 4	1.0049	1.043	1.49

Probability of Causation [%]			
Diet 1	0.163	1.34	11.6
Diet 2	0.074	0.62	5.7
Diet 3	0.061	0.50	4.8
Diet 4	0.486	4.13	32.8

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.31	1.7	9.1
Commercial Milk (locally produced)	0.076	0.48	3.2
Commercial Milk (regionally mixed)	0.078	0.47	3.1
Goat Milk (locally produced)	0.8	5.3	35
Beef (locally produced)	0.0009	0.014	0.3
Leafy Vegetables (locally produced)	0.00026	0.0025	0.021
Eggs (locally produced)	0.019	0.13	0.9
Cottage Cheese (locally produced)	0.00058	0.0055	0.06
Inhalation	0.017	0.061	0.22
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.37	1.9	10
Diet 2	0.15	0.74	4.1
Diet 3	0.11	0.54	3.3

Excess Lifetime Risk [ ]			
Diet 1	4.6E-07	1.5E-05	3.3E-04
Diet 2	2.1E-07	6.5E-06	1.5E-04
Diet 3	1.8E-07	5.0E-06	1.2E-04
Diet 4	1.4E-06	4.0E-05	1.1E-03

Relative Risk [ ]			
Diet 1	1.00042	1.0096	1.2
Diet 2	1.00023	1.0044	1.081
Diet 3	1.00018	1.0032	1.067
Diet 4	1.0013	1.031	1.59

Probability of Causation [%]			
Diet 1	0.042	0.95	16.4
Diet 2	0.023	0.44	7.5
Diet 3	0.018	0.32	6.2
Diet 4	0.132	2.97	37.2

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.12	0.71	4.3
Commercial Milk (locally produced)	0.03	0.21	1.2
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.3	2.2	14
Beef (locally produced)	0.00033	0.005	0.1
Leafy Vegetables (locally produced)	0.00011	0.0012	0.01
Eggs (locally produced)	0.0079	0.054	0.38
Cottage Cheese (locally produced)	0.00027	0.0027	0.029
Inhalation	0.0087	0.03	0.12
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.15	0.82	4.7
Diet 2	0.061	0.33	1.7
Diet 3	0.088	0.46	2.7

Excess Lifetime Risk [ ]			
Diet 1	2.2E-06	2.8E-05	3.2E-04
Diet 2	1.1E-06	1.2E-05	1.4E-04
Diet 3	1.5E-06	1.8E-05	1.9E-04
Diet 4	6.4E-06	8.8E-05	1.2E-03

Relative Risk [ ]			
Diet 1	1.00074	1.0067	1.067
Diet 2	1.00034	1.0029	1.031
Diet 3	1.00055	1.0048	1.049
Diet 4	1.0025	1.022	1.26

Probability of Causation [%]			
Diet 1	0.074	0.67	6.2
Diet 2	0.034	0.29	3.0
Diet 3	0.055	0.47	4.7
Diet 4	0.247	2.11	20.9

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.15	0.81	4.7
Commercial Milk (locally produced)	0.035	0.23	1.4
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	0.36	2.6	17
Beef (locally produced)	0.00048	0.0071	0.15
Leafy Vegetables (locally produced)	0.00011	0.0012	0.011
Eggs (locally produced)	0.0088	0.067	0.44
Cottage Cheese (locally produced)	0.00024	0.0028	0.028
Inhalation	0.0088	0.033	0.13
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.19	0.93	5.1
Diet 2	0.07	0.36	2
Diet 3	0.095	0.51	3.2

Excess Lifetime Risk [ ]			
Diet 1	2.3E-07	6.8E-06	1.7E-04
Diet 2	1.0E-07	3.2E-06	6.9E-05
Diet 3	1.8E-07	4.8E-06	1.2E-04
Diet 4	7.7E-07	2.0E-05	5.8E-04

Relative Risk [ ]			
Diet 1	1.00022	1.0048	1.1
Diet 2	1.00011	1.0022	1.04
Diet 3	1.00017	1.0031	1.065
Diet 4	1.00066	1.014	1.3

Probability of Causation [%]			
Diet 1	0.022	0.48	9.2
Diet 2	0.011	0.22	3.8
Diet 3	0.017	0.31	6.1
Diet 4	0.066	1.39	23.3

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**  
**Receptor: Female born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.23	1.3	7.6
Commercial Milk (locally produced)	0.063	0.38	2.3
Commercial Milk (regionally mixed)	0.071	0.43	2.6
Goat Milk (locally produced)	0.67	4.1	25
Beef (locally produced)	0.00055	0.0094	0.19
Leafy Vegetables (locally produced)	0.00023	0.0024	0.02
Eggs (locally produced)	0.016	0.1	0.64
Cottage Cheese (locally produced)	0.00049	0.005	0.051
Inhalation	0.015	0.049	0.17
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.28	1.5	8.7
Diet 2	0.13	0.59	3.1
Diet 3	0.1	0.48	2.8

Excess Lifetime Risk [ ]			
Diet 1	3.9E-06	5.0E-05	6.1E-04
Diet 2	2.1E-06	2.2E-05	2.6E-04
Diet 3	1.7E-06	1.9E-05	2.0E-04
Diet 4	1.2E-05	1.7E-04	2.4E-03

Relative Risk [ ]			
Diet 1	1.0014	1.012	1.12
Diet 2	1.00067	1.0057	1.058
Diet 3	1.00059	1.0049	1.05
Diet 4	1.0047	1.039	1.45

Probability of Causation [%]			
Diet 1	0.144	1.18	10.6
Diet 2	0.067	0.57	5.5
Diet 3	0.058	0.49	4.7
Diet 4	0.470	3.79	31.2

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**

**Receptor: Male born in 1935**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.31	1.5	8.6
Commercial Milk (locally produced)	0.069	0.42	2.9
Commercial Milk (regionally mixed)	0.078	0.47	3
Goat Milk (locally produced)	0.74	4.9	32
Beef (locally produced)	0.00082	0.013	0.27
Leafy Vegetables (locally produced)	0.00023	0.0023	0.02
Eggs (locally produced)	0.018	0.12	0.79
Cottage Cheese (locally produced)	0.0005	0.0051	0.052
Inhalation	0.016	0.053	0.19
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.35	1.7	9.7
Diet 2	0.14	0.66	3.7
Diet 3	0.11	0.54	3.2

Excess Lifetime Risk [ ]			
Diet 1	4.2E-07	1.3E-05	3.1E-04
Diet 2	1.9E-07	5.7E-06	1.3E-04
Diet 3	1.8E-07	5.0E-06	1.2E-04
Diet 4	1.3E-06	3.5E-05	9.3E-04

Relative Risk [ ]			
Diet 1	1.00039	1.0091	1.18
Diet 2	1.0002	1.004	1.071
Diet 3	1.00018	1.0032	1.066
Diet 4	1.0012	1.028	1.55

Probability of Causation [%]			
Diet 1	0.039	0.90	15.3
Diet 2	0.020	0.40	6.6
Diet 3	0.018	0.32	6.2
Diet 4	0.118	2.73	35.3

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.1	17	110
Commercial Milk (locally produced)	0.82	5.8	40
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	7	57	360
Beef (locally produced)	0.0059	0.097	2
Leafy Vegetables (locally produced)	0.0021	0.025	0.21
Eggs (locally produced)	0.16	1.3	8.8
Cottage Cheese (locally produced)	0.0046	0.049	0.53
Inhalation	0.11	0.38	1.3
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	3.5	19	120
Diet 2	1.4	7.9	49
Diet 3	0.3	1.2	6.1

Excess Lifetime Risk [ ]			
Diet 1	1.2E-04	2.0E-03	2.3E-02
Diet 2	5.7E-05	7.5E-04	9.6E-03
Diet 3	1.2E-05	1.1E-04	1.1E-03
Diet 4	3.8E-04	5.3E-03	6.1E-02

Relative Risk [ ]			
Diet 1	1.048	1.44	6.1
Diet 2	1.02	1.19	3.4
Diet 3	1.0034	1.028	1.28
Diet 4	1.13	2.2	18

Probability of Causation [%]			
Diet 1	4.54	30.4	83
Diet 2	2.01	15.9	71
Diet 3	0.34	2.8	22
Diet 4	11.62	54.9	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**  
**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.1	18	110
Commercial Milk (locally produced)	0.88	5.9	39
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	7.7	58	380
Beef (locally produced)	0.0069	0.12	2.4
Leafy Vegetables (locally produced)	0.0021	0.024	0.21
Eggs (locally produced)	0.2	1.5	10
Cottage Cheese (locally produced)	0.0046	0.049	0.53
Inhalation	0.11	0.39	1.4
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	3.5	20	130
Diet 2	1.4	8.6	51
Diet 3	0.29	1.3	6.2

Excess Lifetime Risk [ ]			
Diet 1	1.5E-05	4.8E-04	1.1E-02
Diet 2	6.3E-06	2.1E-04	4.7E-03
Diet 3	1.1E-06	2.9E-05	6.0E-04
Diet 4	3.7E-05	1.2E-03	3.1E-02

Relative Risk [ ]			
Diet 1	1.015	1.31	7.8
Diet 2	1.0066	1.13	3.9
Diet 3	1.0011	1.017	1.37
Diet 4	1.041	1.83	20

Probability of Causation [%]			
Diet 1	1.46	23.9	87
Diet 2	0.66	11.6	74
Diet 3	0.11	1.7	27
Diet 4	3.92	45.3	95

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.3	21	120
Commercial Milk (locally produced)	1.2	7.1	46
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	8.1	68	440
Beef (locally produced)	0.0069	0.12	2.6
Leafy Vegetables (locally produced)	0.0026	0.031	0.27
Eggs (locally produced)	0.22	1.6	11
Cottage Cheese (locally produced)	0.0061	0.062	0.6
Inhalation	0.13	0.46	1.7
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	4	24	140
Diet 2	1.7	9.9	55
Diet 3	0.33	1.3	6.4

Excess Lifetime Risk [ ]			
Diet 1	1.5E-04	2.4E-03	2.8E-02
Diet 2	6.6E-05	8.9E-04	1.2E-02
Diet 3	1.3E-05	1.2E-04	1.1E-03
Diet 4	4.2E-04	6.4E-03	8.1E-02

Relative Risk [ ]			
Diet 1	1.056	1.55	7.4
Diet 2	1.024	1.24	3.8
Diet 3	1.0038	1.03	1.3
Diet 4	1.16	2.6	21

Probability of Causation [%]			
Diet 1	5.29	35.6	86
Diet 2	2.35	19.3	74
Diet 3	0.38	3.0	23
Diet 4	13.62	61.0	95

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.9	22	130
Commercial Milk (locally produced)	1.2	7.3	43
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	8.5	72	470
Beef (locally produced)	0.0081	0.14	3.1
Leafy Vegetables (locally produced)	0.0028	0.03	0.25
Eggs (locally produced)	0.28	1.8	12
Cottage Cheese (locally produced)	0.0066	0.061	0.62
Inhalation	0.13	0.49	1.6
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	4.6	24	150
Diet 2	1.8	11	56
Diet 3	0.31	1.4	6.5

Excess Lifetime Risk [ ]			
Diet 1	1.9E-05	5.9E-04	1.2E-02
Diet 2	7.7E-06	2.5E-04	5.6E-03
Diet 3	1.2E-06	3.3E-05	6.4E-04
Diet 4	4.8E-05	1.4E-03	4.3E-02

Relative Risk [ ]			
Diet 1	1.018	1.38	9.9
Diet 2	1.0074	1.16	4.3
Diet 3	1.0011	1.019	1.39
Diet 4	1.041	2	23

Probability of Causation [%]			
Diet 1	1.78	27.4	90
Diet 2	0.73	13.8	77
Diet 3	0.11	1.9	28
Diet 4	3.89	50.7	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.74	4.5	27
Commercial Milk (locally produced)	0.21	1.5	10
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0015	0.025	0.54
Leafy Vegetables (locally produced)	0.00055	0.0064	0.055
Eggs (locally produced)	0.042	0.32	2.4
Cottage Cheese (locally produced)	0.0012	0.013	0.14
Inhalation	0.028	0.1	0.36
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.86	5	30
Diet 2	0.35	2.1	13
Diet 3	0.18	0.88	5.1

Excess Lifetime Risk [ ]			
Diet 1	3.3E-05	5.0E-04	6.1E-03
Diet 2	1.6E-05	1.9E-04	2.4E-03
Diet 3	7.7E-06	8.4E-05	1.0E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.012	1.12	2.3
Diet 2	1.0052	1.05	1.62
Diet 3	1.0025	1.022	1.25
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	1.18	10.2	55
Diet 2	0.52	4.8	37
Diet 3	0.25	2.1	20
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.8	4.6	30
Commercial Milk (locally produced)	0.23	1.5	10
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0018	0.03	0.67
Leafy Vegetables (locally produced)	0.00055	0.0062	0.054
Eggs (locally produced)	0.052	0.38	2.7
Cottage Cheese (locally produced)	0.0012	0.013	0.15
Inhalation	0.026	0.11	0.38
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.91	5.3	34
Diet 2	0.36	2.2	13
Diet 3	0.18	0.93	5.1

Excess Lifetime Risk [ ]			
Diet 1	3.6E-06	1.3E-04	2.7E-03
Diet 2	1.7E-06	5.5E-05	1.2E-03
Diet 3	7.8E-07	2.1E-05	5.0E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.0036	1.08	2.9
Diet 2	1.0017	1.033	1.85
Diet 3	1.00072	1.013	1.32
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.36	7.4	64
Diet 2	0.17	3.2	45
Diet 3	0.07	1.3	25
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2	12	71
Commercial Milk (locally produced)	0.62	3.9	28
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0038	0.069	1.5
Leafy Vegetables (locally produced)	0.0017	0.017	0.16
Eggs (locally produced)	0.12	0.89	6.1
Cottage Cheese (locally produced)	0.0035	0.034	0.4
Inhalation	0.076	0.28	0.99
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2.3	14	81
Diet 2	0.95	5.4	35
Diet 3	0.25	1.1	5.7

Excess Lifetime Risk [ ]			
Diet 1	8.4E-05	1.3E-03	1.7E-02
Diet 2	4.3E-05	5.2E-04	6.5E-03
Diet 3	1.0E-05	1.0E-04	1.1E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.035	1.31	4.4
Diet 2	1.014	1.13	2.6
Diet 3	1.0031	1.026	1.27
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	3.40	23.7	77
Diet 2	1.38	11.8	62
Diet 3	0.31	2.5	21
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.2	12	81
Commercial Milk (locally produced)	0.6	4.1	28
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0046	0.081	1.9
Leafy Vegetables (locally produced)	0.0016	0.017	0.15
Eggs (locally produced)	0.15	1	6.8
Cottage Cheese (locally produced)	0.0033	0.034	0.4
Inhalation	0.076	0.28	0.97
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2.6	14	91
Diet 2	1	5.9	35
Diet 3	0.25	1.1	5.6

Excess Lifetime Risk [ ]			
Diet 1	9.4E-06	3.3E-04	7.4E-03
Diet 2	4.2E-06	1.4E-04	3.4E-03
Diet 3	1.0E-06	2.7E-05	5.7E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.011	1.22	5.6
Diet 2	1.0042	1.092	3.1
Diet 3	1.00092	1.016	1.35
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	1.09	18.1	82
Diet 2	0.42	8.4	67
Diet 3	0.09	1.6	26
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.9	12	69
Commercial Milk (locally produced)	0.62	3.9	28
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	4.6	38	250
Beef (locally produced)	0.0038	0.068	1.4
Leafy Vegetables (locally produced)	0.0016	0.017	0.15
Eggs (locally produced)	0.12	0.89	6
Cottage Cheese (locally produced)	0.0034	0.034	0.39
Inhalation	0.079	0.28	1
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2.2	13	78
Diet 2	0.94	5.4	35
Diet 3	0.26	1.1	5.8

Excess Lifetime Risk [ ]			
Diet 1	7.9E-05	1.3E-03	1.6E-02
Diet 2	4.2E-05	5.1E-04	6.0E-03
Diet 3	1.0E-05	1.0E-04	1.1E-03
Diet 4	2.5E-04	3.6E-03	4.5E-02

Relative Risk [ ]			
Diet 1	1.035	1.31	4.3
Diet 2	1.014	1.14	2.6
Diet 3	1.0031	1.026	1.27
Diet 4	1.089	1.89	12

Probability of Causation [%]			
Diet 1	3.34	23.6	76
Diet 2	1.34	11.9	60
Diet 3	0.31	2.5	21
Diet 4	8.17	46.8	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**  
**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.2	12	81
Commercial Milk (locally produced)	0.6	4.1	27
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	5.3	40	280
Beef (locally produced)	0.0045	0.081	1.7
Leafy Vegetables (locally produced)	0.0016	0.017	0.14
Eggs (locally produced)	0.15	1	6.6
Cottage Cheese (locally produced)	0.0032	0.034	0.37
Inhalation	0.076	0.27	1
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2.5	14	90
Diet 2	1	5.8	34
Diet 3	0.25	1.1	5.7

Excess Lifetime Risk [ ]			
Diet 1	9.1E-06	3.3E-04	6.9E-03
Diet 2	4.0E-06	1.4E-04	3.3E-03
Diet 3	1.0E-06	2.7E-05	5.6E-04
Diet 4	2.7E-05	8.1E-04	2.0E-02

Relative Risk [ ]			
Diet 1	1.011	1.22	5.4
Diet 2	1.0042	1.088	3
Diet 3	1.00092	1.016	1.35
Diet 4	1.027	1.58	14

Probability of Causation [%]			
Diet 1	1.07	17.8	81
Diet 2	0.42	8.1	66
Diet 3	0.09	1.6	26
Diet 4	2.62	36.4	93

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.27	1.6	11
Commercial Milk (locally produced)	0.078	0.57	4.3
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.66	5.4	45
Beef (locally produced)	0.00054	0.0098	0.21
Leafy Vegetables (locally produced)	0.0002	0.0025	0.023
Eggs (locally produced)	0.016	0.12	0.95
Cottage Cheese (locally produced)	0.00043	0.0048	0.064
Inhalation	0.011	0.041	0.17
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.32	1.8	12
Diet 2	0.13	0.78	5.6
Diet 3	0.15	0.81	5

Excess Lifetime Risk [ ]			
Diet 1	1.2E-05	1.8E-04	2.8E-03
Diet 2	6.2E-06	7.7E-05	9.7E-04
Diet 3	6.6E-06	7.7E-05	9.8E-04
Diet 4	3.3E-05	5.0E-04	6.5E-03

Relative Risk [ ]			
Diet 1	1.0043	1.044	1.59
Diet 2	1.0019	1.018	1.25
Diet 3	1.0023	1.02	1.24
Diet 4	1.011	1.12	3

Probability of Causation [%]			
Diet 1	0.43	4.2	37
Diet 2	0.19	1.8	20
Diet 3	0.23	2.0	19
Diet 4	1.10	11.1	66

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	1.7	11
Commercial Milk (locally produced)	0.084	0.58	4.4
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.7	5.7	48
Beef (locally produced)	0.00061	0.012	0.24
Leafy Vegetables (locally produced)	0.00021	0.0025	0.023
Eggs (locally produced)	0.019	0.14	1.1
Cottage Cheese (locally produced)	0.00045	0.0049	0.062
Inhalation	0.012	0.042	0.17
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.34	1.9	13
Diet 2	0.14	0.83	5.6
Diet 3	0.15	0.85	4.9

Excess Lifetime Risk [ ]			
Diet 1	1.2E-06	4.6E-05	1.1E-03
Diet 2	6.8E-07	2.0E-05	4.9E-04
Diet 3	7.1E-07	2.0E-05	4.8E-04
Diet 4	3.6E-06	1.2E-04	3.3E-03

Relative Risk [ ]			
Diet 1	1.0012	1.032	1.7
Diet 2	1.0006	1.013	1.31
Diet 3	1.00065	1.013	1.32
Diet 4	1.0034	1.086	3

Probability of Causation [%]			
Diet 1	0.12	3.1	41
Diet 2	0.06	1.3	24
Diet 3	0.07	1.3	24
Diet 4	0.34	7.9	67

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0024	0.026	0.28
Inhalation	0.057	0.2	0.75
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.23	0.99	5.5

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	9.3E-06	9.3E-05	1.1E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0029	1.024	1.26
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.29	2.4	21
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0025	0.025	0.27
Inhalation	0.056	0.21	0.73
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.21	1	5.5

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	9.0E-07	2.4E-05	5.4E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00084	1.015	1.34
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.08	1.5	26
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.9	11	58
Commercial Milk (locally produced)	0.63	3.6	27
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	4.7	36	240
Beef (locally produced)	0.0036	0.066	1.3
Leafy Vegetables (locally produced)	0.0016	0.017	0.13
Eggs (locally produced)	0.12	0.83	5.7
Cottage Cheese (locally produced)	0.0032	0.032	0.33
Inhalation	0.079	0.27	0.98
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2.3	13	65
Diet 2	0.97	5.2	34
Diet 3	0.26	1.1	5.7

Excess Lifetime Risk [ ]			
Diet 1	8.1E-05	1.2E-03	1.7E-02
Diet 2	4.2E-05	4.8E-04	5.8E-03
Diet 3	1.0E-05	9.8E-05	1.1E-03
Diet 4	2.5E-04	3.4E-03	4.4E-02

Relative Risk [ ]			
Diet 1	1.034	1.29	4.4
Diet 2	1.013	1.13	2.5
Diet 3	1.0031	1.026	1.27
Diet 4	1.087	1.84	12

Probability of Causation [%]			
Diet 1	3.31	22.7	77
Diet 2	1.33	11.4	60
Diet 3	0.31	2.5	21
Diet 4	8.04	45.5	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.2	12	66
Commercial Milk (locally produced)	0.61	3.8	26
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	4.9	39	240
Beef (locally produced)	0.0044	0.079	1.6
Leafy Vegetables (locally produced)	0.0017	0.016	0.13
Eggs (locally produced)	0.16	0.94	6.3
Cottage Cheese (locally produced)	0.0033	0.033	0.35
Inhalation	0.075	0.26	1
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2.5	13	75
Diet 2	1	5.5	33
Diet 3	0.25	1.1	5.6

Excess Lifetime Risk [ ]			
Diet 1	9.2E-06	3.0E-04	6.9E-03
Diet 2	3.6E-06	1.3E-04	3.0E-03
Diet 3	9.5E-07	2.7E-05	5.7E-04
Diet 4	2.6E-05	7.8E-04	2.0E-02

Relative Risk [ ]			
Diet 1	1.0087	1.2	5.3
Diet 2	1.0041	1.08	2.9
Diet 3	1.0009	1.016	1.35
Diet 4	1.027	1.56	14

Probability of Causation [%]			
Diet 1	0.86	16.8	81
Diet 2	0.41	7.4	66
Diet 3	0.09	1.6	26
Diet 4	2.61	35.7	93

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.39	2.2	14
Commercial Milk (locally produced)	0.12	0.76	5.9
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	1	7.6	55
Beef (locally produced)	0.00082	0.013	0.27
Leafy Vegetables (locally produced)	0.00029	0.0034	0.031
Eggs (locally produced)	0.022	0.17	1.4
Cottage Cheese (locally produced)	0.00064	0.0066	0.081
Inhalation	0.015	0.056	0.24
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.44	2.5	16
Diet 2	0.19	1.1	7.4
Diet 3	0.16	0.83	5

Excess Lifetime Risk [ ]			
Diet 1	1.6E-05	2.6E-04	3.3E-03
Diet 2	7.3E-06	1.1E-04	1.3E-03
Diet 3	6.7E-06	7.8E-05	9.9E-04
Diet 4	5.1E-05	7.5E-04	8.7E-03

Relative Risk [ ]			
Diet 1	1.0062	1.058	1.78
Diet 2	1.003	1.025	1.4
Diet 3	1.0023	1.021	1.24
Diet 4	1.018	1.16	3.4

Probability of Causation [%]			
Diet 1	0.62	5.4	44
Diet 2	0.30	2.4	28
Diet 3	0.23	2.0	19
Diet 4	1.80	13.9	70

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.38	2.3	14
Commercial Milk (locally produced)	0.13	0.8	5.8
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.97	7.9	63
Beef (locally produced)	0.00099	0.015	0.31
Leafy Vegetables (locally produced)	0.00029	0.0033	0.031
Eggs (locally produced)	0.026	0.2	1.5
Cottage Cheese (locally produced)	0.00067	0.0067	0.085
Inhalation	0.015	0.059	0.22
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.45	2.6	16
Diet 2	0.21	1.1	7.7
Diet 3	0.15	0.86	5

Excess Lifetime Risk [ ]			
Diet 1	1.7E-06	6.4E-05	1.4E-03
Diet 2	8.3E-07	2.8E-05	6.5E-04
Diet 3	7.4E-07	2.1E-05	4.9E-04
Diet 4	5.1E-06	1.5E-04	4.2E-03

Relative Risk [ ]			
Diet 1	1.0019	1.041	2.1
Diet 2	1.00077	1.018	1.43
Diet 3	1.00066	1.013	1.32
Diet 4	1.005	1.12	3.6

Probability of Causation [%]			
Diet 1	0.19	3.9	51
Diet 2	0.08	1.8	30
Diet 3	0.07	1.3	24
Diet 4	0.50	10.5	72

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0014	0.015	0.15
Inhalation	0.034	0.12	0.46
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.2	0.9	5.2

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	8.2E-06	8.6E-05	1.0E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0025	1.022	1.25
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.25	2.2	20
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0016	0.014	0.15
Inhalation	0.035	0.12	0.44
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.19	0.95	5.1

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	8.1E-07	2.2E-05	5.0E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00074	1.014	1.33
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.07	1.4	25
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.35	2.1	15
Commercial Milk (locally produced)	0.11	0.73	5.6
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.88	7.1	52
Beef (locally produced)	0.00071	0.013	0.29
Leafy Vegetables (locally produced)	0.00031	0.0032	0.029
Eggs (locally produced)	0.02	0.16	1.2
Cottage Cheese (locally produced)	0.00058	0.0064	0.078
Inhalation	0.014	0.054	0.21
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.41	2.3	16
Diet 2	0.17	1	7.2
Diet 3	0.16	0.82	5

Excess Lifetime Risk [ ]			
Diet 1	1.5E-05	2.5E-04	3.4E-03
Diet 2	7.6E-06	9.9E-05	1.4E-03
Diet 3	6.7E-06	7.9E-05	9.9E-04
Diet 4	4.5E-05	6.7E-04	8.9E-03

Relative Risk [ ]			
Diet 1	1.0059	1.055	1.61
Diet 2	1.0026	1.024	1.31
Diet 3	1.0022	1.02	1.24
Diet 4	1.017	1.15	3.1

Probability of Causation [%]			
Diet 1	0.59	5.2	38
Diet 2	0.26	2.3	24
Diet 3	0.22	2.0	19
Diet 4	1.70	13.3	67

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.36	2.2	16
Commercial Milk (locally produced)	0.11	0.72	5.5
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.99	7.3	56
Beef (locally produced)	0.00084	0.015	0.35
Leafy Vegetables (locally produced)	0.00032	0.0031	0.029
Eggs (locally produced)	0.024	0.18	1.4
Cottage Cheese (locally produced)	0.00057	0.0064	0.079
Inhalation	0.014	0.054	0.21
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.42	2.6	18
Diet 2	0.18	1.1	7.2
Diet 3	0.16	0.86	5

Excess Lifetime Risk [ ]			
Diet 1	1.6E-06	5.8E-05	1.3E-03
Diet 2	7.9E-07	2.5E-05	6.4E-04
Diet 3	7.2E-07	2.0E-05	4.8E-04
Diet 4	4.9E-06	1.5E-04	4.0E-03

Relative Risk [ ]			
Diet 1	1.0018	1.039	1.93
Diet 2	1.00077	1.017	1.41
Diet 3	1.00065	1.013	1.32
Diet 4	1.0045	1.11	4.2

Probability of Causation [%]			
Diet 1	0.18	3.8	48
Diet 2	0.08	1.6	29
Diet 3	0.07	1.3	24
Diet 4	0.45	10.1	76

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0021	0.022	0.22
Inhalation	0.053	0.18	0.66
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.22	0.97	5.4

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	9.0E-06	9.1E-05	1.0E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0028	1.024	1.26
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.28	2.3	21
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0022	0.022	0.23
Inhalation	0.052	0.18	0.66
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.21	1	5.3

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	8.7E-07	2.4E-05	5.2E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00081	1.015	1.34
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.08	1.5	25
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.8	10	61
Commercial Milk (locally produced)	0.56	3.6	24
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	4.6	35	230
Beef (locally produced)	0.0036	0.06	1.2
Leafy Vegetables (locally produced)	0.0014	0.016	0.13
Eggs (locally produced)	0.11	0.77	5.7
Cottage Cheese (locally produced)	0.0031	0.031	0.32
Inhalation	0.074	0.26	1
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2.1	12	70
Diet 2	0.95	5	32
Diet 3	0.26	1.1	5.7

Excess Lifetime Risk [ ]			
Diet 1	7.5E-05	1.2E-03	1.4E-02
Diet 2	3.7E-05	4.7E-04	5.9E-03
Diet 3	1.0E-05	9.9E-05	1.1E-03
Diet 4	2.4E-04	3.3E-03	3.8E-02

Relative Risk [ ]			
Diet 1	1.031	1.28	4.2
Diet 2	1.013	1.12	2.5
Diet 3	1.0031	1.026	1.27
Diet 4	1.088	1.78	12

Probability of Causation [%]			
Diet 1	3.04	21.8	76
Diet 2	1.32	10.4	60
Diet 3	0.31	2.5	21
Diet 4	8.10	43.7	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.8	11	67
Commercial Milk (locally produced)	0.59	3.7	24
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	4.9	37	250
Beef (locally produced)	0.0042	0.07	1.4
Leafy Vegetables (locally produced)	0.0014	0.015	0.13
Eggs (locally produced)	0.13	0.9	6.5
Cottage Cheese (locally produced)	0.0032	0.031	0.34
Inhalation	0.077	0.27	0.98
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2.1	12	76
Diet 2	0.96	5.4	32
Diet 3	0.25	1.1	5.7

Excess Lifetime Risk [ ]			
Diet 1	8.0E-06	3.0E-04	6.0E-03
Diet 2	4.0E-06	1.2E-04	2.9E-03
Diet 3	1.0E-06	2.6E-05	5.7E-04
Diet 4	2.3E-05	7.0E-04	1.7E-02

Relative Risk [ ]			
Diet 1	1.0091	1.19	5.2
Diet 2	1.0039	1.079	2.7
Diet 3	1.0009	1.016	1.35
Diet 4	1.023	1.53	13

Probability of Causation [%]			
Diet 1	0.91	15.6	80
Diet 2	0.39	7.4	63
Diet 3	0.09	1.5	26
Diet 4	2.23	34.6	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.27	1.6	10
Commercial Milk (locally produced)	0.084	0.54	4.2
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.66	5.4	41
Beef (locally produced)	0.00053	0.0094	0.21
Leafy Vegetables (locally produced)	0.0002	0.0024	0.022
Eggs (locally produced)	0.016	0.12	0.91
Cottage Cheese (locally produced)	0.00046	0.0048	0.055
Inhalation	0.011	0.041	0.17
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.32	1.8	12
Diet 2	0.13	0.76	5.4
Diet 3	0.15	0.81	5

Excess Lifetime Risk [ ]			
Diet 1	1.2E-05	1.7E-04	2.6E-03
Diet 2	6.0E-06	7.3E-05	1.0E-03
Diet 3	6.6E-06	7.7E-05	9.8E-04
Diet 4	3.3E-05	4.9E-04	6.7E-03

Relative Risk [ ]			
Diet 1	1.0043	1.043	1.55
Diet 2	1.0019	1.018	1.25
Diet 3	1.0022	1.02	1.24
Diet 4	1.013	1.12	2.7

Probability of Causation [%]			
Diet 1	0.43	4.1	35
Diet 2	0.19	1.8	20
Diet 3	0.22	2.0	19
Diet 4	1.24	10.8	62

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.29	1.7	11
Commercial Milk (locally produced)	0.085	0.56	4.3
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.71	5.7	41
Beef (locally produced)	0.00063	0.011	0.24
Leafy Vegetables (locally produced)	0.00021	0.0023	0.023
Eggs (locally produced)	0.02	0.14	1
Cottage Cheese (locally produced)	0.00045	0.0047	0.057
Inhalation	0.012	0.042	0.16
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.34	1.9	13
Diet 2	0.14	0.83	5.5
Diet 3	0.15	0.85	5

Excess Lifetime Risk [ ]			
Diet 1	1.2E-06	4.5E-05	1.1E-03
Diet 2	5.7E-07	2.0E-05	4.6E-04
Diet 3	7.1E-07	2.0E-05	4.8E-04
Diet 4	3.5E-06	1.2E-04	3.0E-03

Relative Risk [ ]			
Diet 1	1.0013	1.031	1.71
Diet 2	1.00057	1.013	1.31
Diet 3	1.00064	1.013	1.32
Diet 4	1.003	1.085	3.1

Probability of Causation [%]			
Diet 1	0.13	3.0	41
Diet 2	0.06	1.3	23
Diet 3	0.06	1.3	24
Diet 4	0.30	7.8	67

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.7	9.4	55
Commercial Milk (locally produced)	0.49	3.2	22
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	4.1	31	210
Beef (locally produced)	0.0031	0.055	1.1
Leafy Vegetables (locally produced)	0.0014	0.014	0.12
Eggs (locally produced)	0.099	0.69	4.9
Cottage Cheese (locally produced)	0.0028	0.028	0.33
Inhalation	0.072	0.24	0.88
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2	11	63
Diet 2	0.85	4.5	29
Diet 3	0.25	1.1	5.7

Excess Lifetime Risk [ ]			
Diet 1	6.9E-05	1.1E-03	1.4E-02
Diet 2	3.7E-05	4.2E-04	5.2E-03
Diet 3	1.0E-05	9.7E-05	1.1E-03
Diet 4	2.0E-04	2.9E-03	3.4E-02

Relative Risk [ ]			
Diet 1	1.028	1.26	3.7
Diet 2	1.012	1.11	2.3
Diet 3	1.0029	1.025	1.27
Diet 4	1.075	1.71	11

Probability of Causation [%]			
Diet 1	2.76	20.4	73
Diet 2	1.15	10.0	56
Diet 3	0.29	2.4	21
Diet 4	6.94	41.3	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.8	10	63
Commercial Milk (locally produced)	0.51	3.4	22
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	4.5	33	230
Beef (locally produced)	0.0037	0.064	1.3
Leafy Vegetables (locally produced)	0.0014	0.014	0.12
Eggs (locally produced)	0.12	0.83	5.4
Cottage Cheese (locally produced)	0.0029	0.028	0.3
Inhalation	0.072	0.25	0.88
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	2.1	11	72
Diet 2	0.86	4.8	28
Diet 3	0.24	1.1	5.6

Excess Lifetime Risk [ ]			
Diet 1	7.6E-06	2.6E-04	6.0E-03
Diet 2	3.6E-06	1.1E-04	2.7E-03
Diet 3	9.6E-07	2.6E-05	5.6E-04
Diet 4	2.2E-05	6.3E-04	1.7E-02

Relative Risk [ ]			
Diet 1	1.0068	1.17	4.7
Diet 2	1.0035	1.073	2.7
Diet 3	1.00091	1.016	1.35
Diet 4	1.022	1.49	12

Probability of Causation [%]			
Diet 1	0.68	14.8	79
Diet 2	0.35	6.8	62
Diet 3	0.09	1.5	26
Diet 4	2.11	32.6	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.73	4	25
Commercial Milk (locally produced)	0.21	1.4	9.5
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	1.7	13	90
Beef (locally produced)	0.0014	0.023	0.47
Leafy Vegetables (locally produced)	0.00054	0.0059	0.053
Eggs (locally produced)	0.043	0.29	2.2
Cottage Cheese (locally produced)	0.0011	0.012	0.14
Inhalation	0.028	0.1	0.38
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.85	4.6	27
Diet 2	0.36	1.9	13
Diet 3	0.19	0.88	5.2

Excess Lifetime Risk [ ]			
Diet 1	2.9E-05	4.4E-04	5.8E-03
Diet 2	1.4E-05	1.8E-04	2.3E-03
Diet 3	7.9E-06	8.3E-05	1.0E-03
Diet 4	8.5E-05	1.2E-03	1.4E-02

Relative Risk [ ]			
Diet 1	1.012	1.11	2.3
Diet 2	1.0051	1.045	1.57
Diet 3	1.0025	1.022	1.25
Diet 4	1.031	1.29	5.4

Probability of Causation [%]			
Diet 1	1.15	9.4	55
Diet 2	0.51	4.3	35
Diet 3	0.25	2.1	20
Diet 4	3.00	22.0	80

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.73	4.2	27
Commercial Milk (locally produced)	0.22	1.4	9.8
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	1.9	14	100
Beef (locally produced)	0.0016	0.027	0.56
Leafy Vegetables (locally produced)	0.00054	0.0059	0.053
Eggs (locally produced)	0.048	0.34	2.5
Cottage Cheese (locally produced)	0.0011	0.012	0.13
Inhalation	0.028	0.1	0.38
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.85	4.8	30
Diet 2	0.36	2.1	13
Diet 3	0.17	0.92	5.1

Excess Lifetime Risk [ ]			
Diet 1	3.3E-06	1.1E-04	2.5E-03
Diet 2	1.6E-06	4.7E-05	1.1E-03
Diet 3	7.9E-07	2.1E-05	5.0E-04
Diet 4	9.2E-06	2.7E-04	7.2E-03

Relative Risk [ ]			
Diet 1	1.003	1.072	2.7
Diet 2	1.0014	1.031	1.72
Diet 3	1.00073	1.013	1.32
Diet 4	1.0089	1.2	5.7

Probability of Causation [%]			
Diet 1	0.30	6.7	61
Diet 2	0.14	3.0	41
Diet 3	0.07	1.3	24
Diet 4	0.88	16.2	81

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0012	0.013	0.14
Inhalation	0.031	0.11	0.42
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.18	0.89	5.2

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	7.9E-06	8.5E-05	1.0E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0025	1.022	1.25
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.25	2.2	20
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0012	0.013	0.14
Inhalation	0.031	0.11	0.41
Mother's milk (mother on Diet 3)	--	--	--
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.18	0.94	5.1

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	8.0E-07	2.2E-05	5.0E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00074	1.014	1.33
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.07	1.3	25
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.82	4.9	29
Commercial Milk (locally produced)	0.25	1.6	11
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	1.9	16	100
Beef (locally produced)	0.0015	0.028	0.63
Leafy Vegetables (locally produced)	0.00073	0.0071	0.065
Eggs (locally produced)	0.049	0.35	2.5
Cottage Cheese (locally produced)	0.0014	0.014	0.16
Inhalation	0.036	0.13	0.47
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.96	5.5	34
Diet 2	0.41	2.2	14
Diet 3	0.2	0.93	5.2

Excess Lifetime Risk [ ]			
Diet 1	3.7E-05	5.4E-04	7.2E-03
Diet 2	1.8E-05	2.2E-04	2.8E-03
Diet 3	8.0E-06	8.7E-05	1.0E-03
Diet 4	1.1E-04	1.5E-03	1.9E-02

Relative Risk [ ]			
Diet 1	1.015	1.13	2.3
Diet 2	1.006	1.056	1.65
Diet 3	1.0026	1.023	1.25
Diet 4	1.038	1.36	5.7

Probability of Causation [%]			
Diet 1	1.47	11.4	56
Diet 2	0.59	5.3	39
Diet 3	0.26	2.2	20
Diet 4	3.66	26.3	82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.94	5.1	33
Commercial Milk (locally produced)	0.25	1.7	11
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	2.3	16	120
Beef (locally produced)	0.0018	0.034	0.74
Leafy Vegetables (locally produced)	0.00069	0.0072	0.064
Eggs (locally produced)	0.061	0.41	2.9
Cottage Cheese (locally produced)	0.0014	0.014	0.17
Inhalation	0.037	0.14	0.48
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.1	5.7	37
Diet 2	0.42	2.4	14
Diet 3	0.19	0.96	5.2

Excess Lifetime Risk [ ]			
Diet 1	4.0E-06	1.4E-04	3.3E-03
Diet 2	1.9E-06	5.9E-05	1.4E-03
Diet 3	8.2E-07	2.2E-05	5.1E-04
Diet 4	1.2E-05	3.4E-04	8.2E-03

Relative Risk [ ]			
Diet 1	1.0041	1.094	2.9
Diet 2	1.0017	1.039	1.83
Diet 3	1.00076	1.014	1.33
Diet 4	1.01	1.24	7.1

Probability of Causation [%]			
Diet 1	0.41	8.6	66
Diet 2	0.17	3.7	45
Diet 3	0.08	1.4	25
Diet 4	1.02	19.2	86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.98	5.5	31
Commercial Milk (locally produced)	0.29	1.8	12
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	2.3	18	130
Beef (locally produced)	0.0018	0.032	0.76
Leafy Vegetables (locally produced)	0.00072	0.0082	0.072
Eggs (locally produced)	0.058	0.42	2.9
Cottage Cheese (locally produced)	0.0016	0.016	0.18
Inhalation	0.041	0.15	0.56
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.2	6.2	35
Diet 2	0.49	2.5	15
Diet 3	0.2	0.94	5.3

Excess Lifetime Risk [ ]			
Diet 1	4.1E-05	6.3E-04	7.1E-03
Diet 2	1.9E-05	2.5E-04	3.0E-03
Diet 3	8.6E-06	8.8E-05	1.0E-03
Diet 4	1.2E-04	1.8E-03	2.0E-02

Relative Risk [ ]			
Diet 1	1.017	1.15	2.6
Diet 2	1.0066	1.061	1.74
Diet 3	1.0027	1.023	1.25
Diet 4	1.042	1.41	6.9

Probability of Causation [%]			
Diet 1	1.63	12.9	61
Diet 2	0.66	5.8	42
Diet 3	0.27	2.2	20
Diet 4	4.03	29.0	85

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	5.6	33
Commercial Milk (locally produced)	0.3	1.9	12
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	2.6	19	130
Beef (locally produced)	0.0021	0.038	0.93
Leafy Vegetables (locally produced)	0.00071	0.008	0.074
Eggs (locally produced)	0.07	0.47	3.2
Cottage Cheese (locally produced)	0.0016	0.016	0.17
Inhalation	0.039	0.15	0.54
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.2	6.5	38
Diet 2	0.5	2.7	15
Diet 3	0.2	0.97	5.3

Excess Lifetime Risk [ ]			
Diet 1	5.1E-06	1.5E-04	3.3E-03
Diet 2	2.2E-06	6.3E-05	1.6E-03
Diet 3	8.3E-07	2.3E-05	5.1E-04
Diet 4	1.3E-05	3.7E-04	9.8E-03

Relative Risk [ ]			
Diet 1	1.0049	1.1	3.3
Diet 2	1.0021	1.043	1.96
Diet 3	1.00078	1.014	1.33
Diet 4	1.013	1.28	7.6

Probability of Causation [%]			
Diet 1	0.48	9.2	70
Diet 2	0.21	4.1	49
Diet 3	0.08	1.4	25
Diet 4	1.29	21.6	87

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.6	3.3	16
Commercial Milk (locally produced)	0.19	1.1	8.1
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0011	0.02	0.39
Leafy Vegetables (locally produced)	0.00054	0.005	0.041
Eggs (locally produced)	0.038	0.25	1.8
Cottage Cheese (locally produced)	0.00098	0.0099	0.11
Inhalation	0.026	0.094	0.36
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.73	3.7	18
Diet 2	0.3	1.5	9.7
Diet 3	0.18	0.87	5.1

Excess Lifetime Risk [ ]			
Diet 1	2.9E-05	3.6E-04	5.2E-03
Diet 2	1.3E-05	1.5E-04	2.0E-03
Diet 3	7.9E-06	8.2E-05	1.0E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.01	1.09	1.96
Diet 2	1.0042	1.037	1.49
Diet 3	1.0024	1.022	1.25
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	1.03	8.3	49
Diet 2	0.42	3.5	33
Diet 3	0.24	2.1	20
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.71	3.5	19
Commercial Milk (locally produced)	0.18	1.1	7.8
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0014	0.023	0.45
Leafy Vegetables (locally produced)	0.00055	0.0049	0.039
Eggs (locally produced)	0.046	0.29	2
Cottage Cheese (locally produced)	0.00098	0.01	0.11
Inhalation	0.027	0.093	0.36
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.82	4	22
Diet 2	0.32	1.6	9.8
Diet 3	0.17	0.92	5

Excess Lifetime Risk [ ]			
Diet 1	2.6E-06	9.1E-05	1.9E-03
Diet 2	1.1E-06	3.9E-05	9.3E-04
Diet 3	7.7E-07	2.2E-05	4.9E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.0028	1.062	2.2
Diet 2	1.0013	1.026	1.57
Diet 3	1.0007	1.013	1.32
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.28	5.9	55
Diet 2	0.13	2.5	36
Diet 3	0.07	1.3	24
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.7	4.3	23
Commercial Milk (locally produced)	0.23	1.4	9.4
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	1.8	14	88
Beef (locally produced)	0.0015	0.025	0.53
Leafy Vegetables (locally produced)	0.00057	0.0064	0.056
Eggs (locally produced)	0.044	0.32	2.2
Cottage Cheese (locally produced)	0.0011	0.012	0.14
Inhalation	0.035	0.12	0.47
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.85	4.9	27
Diet 2	0.39	2	12
Diet 3	0.19	0.89	5.2

Excess Lifetime Risk [ ]			
Diet 1	2.9E-05	4.7E-04	6.2E-03
Diet 2	1.5E-05	2.0E-04	2.5E-03
Diet 3	8.0E-06	8.6E-05	1.0E-03
Diet 4	9.8E-05	1.3E-03	1.7E-02

Relative Risk [ ]			
Diet 1	1.013	1.11	2.3
Diet 2	1.0057	1.049	1.61
Diet 3	1.0026	1.022	1.25
Diet 4	1.034	1.32	5.4

Probability of Causation [%]			
Diet 1	1.26	10.3	57
Diet 2	0.56	4.7	38
Diet 3	0.26	2.2	20
Diet 4	3.25	24.2	81

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways  
Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways  
Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)  
Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.8	4.5	28
Commercial Milk (locally produced)	0.24	1.5	9.7
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	2	15	99
Beef (locally produced)	0.0017	0.03	0.65
Leafy Vegetables (locally produced)	0.0006	0.0061	0.054
Eggs (locally produced)	0.054	0.36	2.3
Cottage Cheese (locally produced)	0.0013	0.012	0.13
Inhalation	0.034	0.12	0.45
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.94	5.1	31
Diet 2	0.4	2.1	13
Diet 3	0.18	0.95	5.2

Excess Lifetime Risk [ ]			
Diet 1	3.5E-06	1.2E-04	2.8E-03
Diet 2	1.7E-06	5.3E-05	1.2E-03
Diet 3	8.0E-07	2.2E-05	5.0E-04
Diet 4	9.8E-06	2.9E-04	7.8E-03

Relative Risk [ ]			
Diet 1	1.0033	1.078	2.7
Diet 2	1.0015	1.033	1.74
Diet 3	1.00075	1.014	1.33
Diet 4	1.0091	1.21	6.7

Probability of Causation [%]			
Diet 1	0.33	7.2	63
Diet 2	0.15	3.2	42
Diet 3	0.08	1.4	25
Diet 4	0.91	17.3	85

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.94	5.8	31
Commercial Milk (locally produced)	0.31	2	12
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	2.4	19	130
Beef (locally produced)	0.0018	0.033	0.71
Leafy Vegetables (locally produced)	0.00077	0.0088	0.073
Eggs (locally produced)	0.061	0.44	3
Cottage Cheese (locally produced)	0.0017	0.018	0.17
Inhalation	0.045	0.16	0.6
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.1	6.6	36
Diet 2	0.52	2.8	15
Diet 3	0.21	0.96	5.4

Excess Lifetime Risk [ ]			
Diet 1	4.5E-05	6.7E-04	7.5E-03
Diet 2	2.1E-05	2.6E-04	3.2E-03
Diet 3	8.8E-06	9.0E-05	1.0E-03
Diet 4	1.3E-04	1.8E-03	2.3E-02

Relative Risk [ ]			
Diet 1	1.017	1.15	2.6
Diet 2	1.0071	1.068	1.74
Diet 3	1.0028	1.023	1.26
Diet 4	1.048	1.44	6.9

Probability of Causation [%]			
Diet 1	1.72	13.4	62
Diet 2	0.71	6.4	42
Diet 3	0.28	2.3	20
Diet 4	4.57	30.5	85

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.1	34
Commercial Milk (locally produced)	0.33	2	12
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	2.7	20	140
Beef (locally produced)	0.0022	0.038	0.85
Leafy Vegetables (locally produced)	0.00078	0.0084	0.072
Eggs (locally produced)	0.077	0.5	3.4
Cottage Cheese (locally produced)	0.0018	0.017	0.17
Inhalation	0.045	0.17	0.59
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.3	6.9	39
Diet 2	0.53	2.9	15
Diet 3	0.2	0.99	5.4

Excess Lifetime Risk [ ]			
Diet 1	5.2E-06	1.6E-04	3.5E-03
Diet 2	2.2E-06	6.9E-05	1.6E-03
Diet 3	8.6E-07	2.3E-05	5.2E-04
Diet 4	1.3E-05	3.8E-04	1.0E-02

Relative Risk [ ]			
Diet 1	1.0047	1.11	3.4
Diet 2	1.0021	1.045	1.94
Diet 3	1.0008	1.015	1.33
Diet 4	1.013	1.3	7.5

Probability of Causation [%]			
Diet 1	0.47	9.7	71
Diet 2	0.21	4.3	48
Diet 3	0.08	1.4	25
Diet 4	1.26	22.8	86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.58	3.3	20
Commercial Milk (locally produced)	0.16	1.1	7.5
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	1.3	11	71
Beef (locally produced)	0.0011	0.019	0.39
Leafy Vegetables (locally produced)	0.00043	0.0048	0.042
Eggs (locally produced)	0.034	0.24	1.7
Cottage Cheese (locally produced)	0.00089	0.0096	0.11
Inhalation	0.027	0.097	0.36
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.69	3.7	22
Diet 2	0.28	1.5	9.4
Diet 3	0.19	0.87	5.1

Excess Lifetime Risk [ ]			
Diet 1	2.4E-05	3.7E-04	4.7E-03
Diet 2	1.2E-05	1.5E-04	1.9E-03
Diet 3	7.8E-06	8.3E-05	1.0E-03
Diet 4	6.7E-05	1.0E-03	1.2E-02

Relative Risk [ ]			
Diet 1	1.0096	1.087	1.89
Diet 2	1.0043	1.037	1.41
Diet 3	1.0024	1.022	1.24
Diet 4	1.024	1.24	4.2

Probability of Causation [%]			
Diet 1	0.95	8.0	47
Diet 2	0.42	3.6	29
Diet 3	0.24	2.1	20
Diet 4	2.31	19.0	76

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.6	3.4	21
Commercial Milk (locally produced)	0.17	1.1	7.7
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	1.5	11	78
Beef (locally produced)	0.0013	0.022	0.45
Leafy Vegetables (locally produced)	0.00046	0.0047	0.041
Eggs (locally produced)	0.04	0.28	1.9
Cottage Cheese (locally produced)	0.0009	0.0096	0.1
Inhalation	0.027	0.099	0.36
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.7	3.9	24
Diet 2	0.29	1.7	9.8
Diet 3	0.17	0.92	5.1

Excess Lifetime Risk [ ]			
Diet 1	2.9E-06	9.0E-05	2.1E-03
Diet 2	1.3E-06	3.9E-05	8.7E-04
Diet 3	7.8E-07	2.1E-05	5.0E-04
Diet 4	7.6E-06	2.2E-04	5.7E-03

Relative Risk [ ]			
Diet 1	1.0025	1.061	2.3
Diet 2	1.0012	1.026	1.53
Diet 3	1.00073	1.013	1.32
Diet 4	1.0074	1.16	4.7

Probability of Causation [%]			
Diet 1	0.25	5.8	56
Diet 2	0.12	2.5	34
Diet 3	0.07	1.3	24
Diet 4	0.73	13.8	78

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.34	1.9	9.6
Commercial Milk (locally produced)	0.11	0.63	4.6
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.81	6.1	42
Beef (locally produced)	0.00065	0.011	0.23
Leafy Vegetables (locally produced)	0.0003	0.0029	0.024
Eggs (locally produced)	0.022	0.14	1
Cottage Cheese (locally produced)	0.00056	0.0056	0.06
Inhalation	0.015	0.053	0.2
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.4	2.1	11
Diet 2	0.18	0.87	5.7
Diet 3	0.15	0.83	5

Excess Lifetime Risk [ ]			
Diet 1	1.6E-05	2.1E-04	3.0E-03
Diet 2	7.7E-06	8.4E-05	1.1E-03
Diet 3	6.9E-06	7.7E-05	9.9E-04
Diet 4	4.4E-05	5.9E-04	7.7E-03

Relative Risk [ ]			
Diet 1	1.0058	1.051	1.54
Diet 2	1.0024	1.021	1.28
Diet 3	1.0022	1.021	1.24
Diet 4	1.015	1.14	2.8

Probability of Causation [%]			
Diet 1	0.58	4.8	35
Diet 2	0.24	2.1	22
Diet 3	0.22	2.0	19
Diet 4	1.50	12.3	65

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.4	2	11
Commercial Milk (locally produced)	0.11	0.65	4.5
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.86	6.4	45
Beef (locally produced)	0.00078	0.014	0.26
Leafy Vegetables (locally produced)	0.00031	0.0028	0.023
Eggs (locally produced)	0.026	0.16	1.2
Cottage Cheese (locally produced)	0.00056	0.0059	0.062
Inhalation	0.015	0.052	0.2
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.46	2.3	13
Diet 2	0.18	0.93	5.7
Diet 3	0.15	0.87	5

Excess Lifetime Risk [ ]			
Diet 1	1.5E-06	5.2E-05	1.1E-03
Diet 2	6.5E-07	2.2E-05	5.4E-04
Diet 3	7.3E-07	2.0E-05	4.8E-04
Diet 4	4.2E-06	1.3E-04	3.4E-03

Relative Risk [ ]			
Diet 1	1.0016	1.035	1.71
Diet 2	1.00073	1.014	1.33
Diet 3	1.00065	1.013	1.32
Diet 4	1.0048	1.096	3.3

Probability of Causation [%]			
Diet 1	0.16	3.4	41
Diet 2	0.07	1.4	25
Diet 3	0.07	1.3	24
Diet 4	0.48	8.8	69

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.79	4.6	27
Commercial Milk (locally produced)	0.24	1.5	10
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	1.8	15	98
Beef (locally produced)	0.0015	0.027	0.59
Leafy Vegetables (locally produced)	0.0007	0.0068	0.057
Eggs (locally produced)	0.046	0.34	2.4
Cottage Cheese (locally produced)	0.0013	0.013	0.15
Inhalation	0.036	0.14	0.48
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.91	5.2	30
Diet 2	0.4	2.1	12
Diet 3	0.2	0.93	5.2

Excess Lifetime Risk [ ]			
Diet 1	3.3E-05	5.2E-04	6.6E-03
Diet 2	1.7E-05	2.1E-04	2.6E-03
Diet 3	8.1E-06	8.7E-05	1.0E-03
Diet 4	1.0E-04	1.4E-03	1.9E-02

Relative Risk [ ]			
Diet 1	1.014	1.12	2.2
Diet 2	1.0058	1.054	1.59
Diet 3	1.0026	1.023	1.25
Diet 4	1.036	1.34	5.4

Probability of Causation [%]			
Diet 1	1.42	10.9	54
Diet 2	0.58	5.1	37
Diet 3	0.26	2.2	20
Diet 4	3.48	25.1	81

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.9	4.8	30
Commercial Milk (locally produced)	0.25	1.6	10
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	2.1	16	110
Beef (locally produced)	0.0017	0.031	0.7
Leafy Vegetables (locally produced)	0.00068	0.0067	0.057
Eggs (locally produced)	0.057	0.39	2.7
Cottage Cheese (locally produced)	0.0014	0.013	0.15
Inhalation	0.037	0.14	0.48
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1	5.4	33
Diet 2	0.41	2.3	13
Diet 3	0.19	0.96	5.2

Excess Lifetime Risk [ ]			
Diet 1	3.7E-06	1.3E-04	2.9E-03
Diet 2	1.7E-06	5.5E-05	1.3E-03
Diet 3	8.2E-07	2.2E-05	5.1E-04
Diet 4	1.1E-05	3.2E-04	7.3E-03

Relative Risk [ ]			
Diet 1	1.0039	1.087	2.8
Diet 2	1.0017	1.036	1.77
Diet 3	1.00077	1.014	1.33
Diet 4	1.0099	1.23	6.4

Probability of Causation [%]			
Diet 1	0.39	8.0	64
Diet 2	0.17	3.5	43
Diet 3	0.08	1.4	25
Diet 4	0.98	18.5	84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.17	1.1	6.5
Commercial Milk (locally produced)	0.054	0.37	2.6
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.4	3.5	25
Beef (locally produced)	0.00036	0.0063	0.13
Leafy Vegetables (locally produced)	0.00014	0.0016	0.014
Eggs (locally produced)	0.01	0.08	0.58
Cottage Cheese (locally produced)	0.0003	0.0032	0.037
Inhalation	0.0082	0.031	0.12
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.2	1.2	7.2
Diet 2	0.09	0.51	3.2
Diet 3	0.14	0.8	5

Excess Lifetime Risk [ ]			
Diet 1	7.6E-06	1.2E-04	1.6E-03
Diet 2	3.9E-06	4.9E-05	6.1E-04
Diet 3	6.3E-06	7.5E-05	9.8E-04
Diet 4	2.1E-05	3.3E-04	4.3E-03

Relative Risk [ ]			
Diet 1	1.0029	1.029	1.31
Diet 2	1.0012	1.012	1.15
Diet 3	1.0021	1.02	1.24
Diet 4	1.0073	1.08	2

Probability of Causation [%]			
Diet 1	0.29	2.8	23
Diet 2	0.12	1.2	13
Diet 3	0.21	2.0	19
Diet 4	0.73	7.3	50

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.18	1.1	7.3
Commercial Milk (locally produced)	0.056	0.38	2.5
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.44	3.7	26
Beef (locally produced)	0.00043	0.0073	0.16
Leafy Vegetables (locally produced)	0.00015	0.0016	0.014
Eggs (locally produced)	0.013	0.093	0.66
Cottage Cheese (locally produced)	0.0003	0.0032	0.037
Inhalation	0.0083	0.031	0.12
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.21	1.3	8.2
Diet 2	0.093	0.54	3.2
Diet 3	0.14	0.84	4.9

Excess Lifetime Risk [ ]			
Diet 1	8.2E-07	3.1E-05	7.4E-04
Diet 2	3.7E-07	1.3E-05	3.3E-04
Diet 3	7.0E-07	2.0E-05	4.8E-04
Diet 4	2.4E-06	7.6E-05	1.9E-03

Relative Risk [ ]			
Diet 1	1.00089	1.021	1.41
Diet 2	1.00039	1.0084	1.19
Diet 3	1.00063	1.013	1.31
Diet 4	1.0023	1.055	2.3

Probability of Causation [%]			
Diet 1	0.09	2.0	29
Diet 2	0.04	0.8	16
Diet 3	0.06	1.3	24
Diet 4	0.23	5.2	55

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.68	3.8	22
Commercial Milk (locally produced)	0.2	1.3	8.5
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	1.6	12	81
Beef (locally produced)	0.0012	0.022	0.49
Leafy Vegetables (locally produced)	0.00057	0.0056	0.048
Eggs (locally produced)	0.039	0.28	1.9
Cottage Cheese (locally produced)	0.0011	0.011	0.12
Inhalation	0.031	0.11	0.4
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.79	4.4	25
Diet 2	0.35	1.8	10
Diet 3	0.19	0.89	5.2

Excess Lifetime Risk [ ]			
Diet 1	2.8E-05	4.2E-04	5.4E-03
Diet 2	1.4E-05	1.7E-04	2.2E-03
Diet 3	7.8E-06	8.5E-05	1.0E-03
Diet 4	8.6E-05	1.2E-03	1.5E-02

Relative Risk [ ]			
Diet 1	1.012	1.1	1.99
Diet 2	1.0048	1.045	1.5
Diet 3	1.0025	1.022	1.25
Diet 4	1.031	1.28	4.6

Probability of Causation [%]			
Diet 1	1.18	9.2	50
Diet 2	0.48	4.3	33
Diet 3	0.25	2.2	20
Diet 4	2.98	21.6	78

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.76	4	24
Commercial Milk (locally produced)	0.21	1.3	8.7
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	1.8	13	89
Beef (locally produced)	0.0015	0.026	0.57
Leafy Vegetables (locally produced)	0.00054	0.0056	0.047
Eggs (locally produced)	0.048	0.33	2.2
Cottage Cheese (locally produced)	0.0011	0.011	0.12
Inhalation	0.031	0.11	0.39
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.87	4.5	27
Diet 2	0.35	1.9	11
Diet 3	0.18	0.94	5.1

Excess Lifetime Risk [ ]			
Diet 1	3.0E-06	1.1E-04	2.4E-03
Diet 2	1.5E-06	4.4E-05	1.1E-03
Diet 3	8.0E-07	2.2E-05	5.0E-04
Diet 4	8.9E-06	2.6E-04	6.3E-03

Relative Risk [ ]			
Diet 1	1.0031	1.072	2.5
Diet 2	1.0014	1.03	1.63
Diet 3	1.00074	1.014	1.33
Diet 4	1.0084	1.19	5.4

Probability of Causation [%]			
Diet 1	0.31	6.7	59
Diet 2	0.14	2.9	39
Diet 3	0.07	1.3	25
Diet 4	0.83	16.1	81

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.3	1.9	9.9
Commercial Milk (locally produced)	0.1	0.62	4.1
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.7	5.9	41
Beef (locally produced)	0.0006	0.011	0.21
Leafy Vegetables (locally produced)	0.00027	0.0027	0.023
Eggs (locally produced)	0.02	0.14	0.96
Cottage Cheese (locally produced)	0.00053	0.0056	0.054
Inhalation	0.015	0.052	0.19
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.37	2.1	11
Diet 2	0.16	0.86	5.1
Diet 3	0.15	0.83	5

Excess Lifetime Risk [ ]			
Diet 1	1.5E-05	2.0E-04	2.6E-03
Diet 2	7.0E-06	8.2E-05	1.1E-03
Diet 3	6.8E-06	7.8E-05	9.9E-04
Diet 4	3.8E-05	5.6E-04	7.6E-03

Relative Risk [ ]			
Diet 1	1.0057	1.049	1.52
Diet 2	1.0023	1.021	1.25
Diet 3	1.0022	1.021	1.24
Diet 4	1.015	1.14	2.9

Probability of Causation [%]			
Diet 1	0.57	4.7	34
Diet 2	0.23	2.1	20
Diet 3	0.22	2.0	19
Diet 4	1.43	12.2	64

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.35	1.9	11
Commercial Milk (locally produced)	0.1	0.64	4
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.76	6.2	44
Beef (locally produced)	0.00071	0.012	0.25
Leafy Vegetables (locally produced)	0.00028	0.0027	0.022
Eggs (locally produced)	0.025	0.16	1.1
Cottage Cheese (locally produced)	0.00057	0.0056	0.056
Inhalation	0.015	0.054	0.2
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.41	2.2	12
Diet 2	0.17	0.92	5.1
Diet 3	0.15	0.87	5

Excess Lifetime Risk [ ]			
Diet 1	1.6E-06	5.1E-05	1.1E-03
Diet 2	6.4E-07	2.2E-05	5.1E-04
Diet 3	7.3E-07	2.0E-05	4.8E-04
Diet 4	4.2E-06	1.2E-04	3.6E-03

Relative Risk [ ]			
Diet 1	1.0015	1.034	1.72
Diet 2	1.00068	1.014	1.3
Diet 3	1.00066	1.013	1.32
Diet 4	1.0041	1.093	3

Probability of Causation [%]			
Diet 1	0.15	3.3	41
Diet 2	0.07	1.4	23
Diet 3	0.07	1.3	24
Diet 4	0.41	8.5	66

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.5	3	17
Commercial Milk (locally produced)	0.16	0.99	6.6
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	1.1	9.7	61
Beef (locally produced)	0.00094	0.017	0.36
Leafy Vegetables (locally produced)	0.00043	0.0044	0.037
Eggs (locally produced)	0.03	0.22	1.5
Cottage Cheese (locally produced)	0.00086	0.0087	0.097
Inhalation	0.024	0.086	0.31
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.59	3.4	19
Diet 2	0.26	1.4	8.3
Diet 3	0.17	0.86	5.1

Excess Lifetime Risk [ ]			
Diet 1	2.0E-05	3.4E-04	4.3E-03
Diet 2	1.1E-05	1.3E-04	1.6E-03
Diet 3	7.4E-06	8.2E-05	1.0E-03
Diet 4	6.0E-05	9.0E-04	1.1E-02

Relative Risk [ ]			
Diet 1	1.009	1.08	1.77
Diet 2	1.0035	1.034	1.38
Diet 3	1.0023	1.021	1.24
Diet 4	1.023	1.22	3.8

Probability of Causation [%]			
Diet 1	0.90	7.4	43
Diet 2	0.35	3.3	27
Diet 3	0.23	2.1	20
Diet 4	2.22	18.1	73

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**  
**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.57	3.1	20
Commercial Milk (locally produced)	0.16	1	6.4
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	1.3	10	69
Beef (locally produced)	0.0011	0.02	0.43
Leafy Vegetables (locally produced)	0.00043	0.0043	0.035
Eggs (locally produced)	0.037	0.26	1.7
Cottage Cheese (locally produced)	0.00088	0.0086	0.093
Inhalation	0.024	0.085	0.32
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.68	3.6	22
Diet 2	0.26	1.5	8
Diet 3	0.17	0.91	5

Excess Lifetime Risk [ ]			
Diet 1	2.3E-06	8.4E-05	1.8E-03
Diet 2	1.1E-06	3.5E-05	8.2E-04
Diet 3	7.6E-07	2.1E-05	4.9E-04
Diet 4	6.8E-06	2.0E-04	4.7E-03

Relative Risk [ ]			
Diet 1	1.0025	1.056	2.1
Diet 2	1.0011	1.023	1.49
Diet 3	1.00071	1.013	1.32
Diet 4	1.0065	1.15	4.3

Probability of Causation [%]			
Diet 1	0.25	5.3	51
Diet 2	0.11	2.2	33
Diet 3	0.07	1.3	24
Diet 4	0.64	13.2	76

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	1.7	9.6
Commercial Milk (locally produced)	0.089	0.57	3.7
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.65	5.4	43
Beef (locally produced)	0.00055	0.0095	0.22
Leafy Vegetables (locally produced)	0.00023	0.0025	0.023
Eggs (locally produced)	0.017	0.12	0.88
Cottage Cheese (locally produced)	0.00048	0.005	0.051
Inhalation	0.015	0.059	0.24
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.34	1.9	11
Diet 2	0.15	0.81	4.6
Diet 3	0.16	0.84	5

Excess Lifetime Risk [ ]			
Diet 1	1.4E-05	1.9E-04	2.3E-03
Diet 2	6.0E-06	7.8E-05	9.2E-04
Diet 3	6.7E-06	7.9E-05	9.9E-04
Diet 4	3.7E-05	5.4E-04	6.7E-03

Relative Risk [ ]			
Diet 1	1.0051	1.045	1.5
Diet 2	1.0021	1.02	1.22
Diet 3	1.0023	1.021	1.24
Diet 4	1.013	1.13	2.7

Probability of Causation [%]			
Diet 1	0.51	4.3	33
Diet 2	0.21	2.0	18
Diet 3	0.23	2.0	19
Diet 4	1.32	11.6	63

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.3	1.7	10
Commercial Milk (locally produced)	0.095	0.59	3.5
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.7	5.7	45
Beef (locally produced)	0.00065	0.011	0.28
Leafy Vegetables (locally produced)	0.00023	0.0025	0.021
Eggs (locally produced)	0.021	0.14	1.1
Cottage Cheese (locally produced)	0.00049	0.0051	0.054
Inhalation	0.014	0.059	0.21
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.37	2	11
Diet 2	0.15	0.86	4.5
Diet 3	0.16	0.88	5

Excess Lifetime Risk [ ]			
Diet 1	1.5E-06	4.7E-05	1.1E-03
Diet 2	6.8E-07	2.0E-05	5.0E-04
Diet 3	7.3E-07	2.0E-05	4.9E-04
Diet 4	3.9E-06	1.1E-04	3.1E-03

Relative Risk [ ]			
Diet 1	1.0014	1.031	1.73
Diet 2	1.00063	1.014	1.27
Diet 3	1.00067	1.013	1.32
Diet 4	1.0037	1.087	2.9

Probability of Causation [%]			
Diet 1	0.14	3.0	42
Diet 2	0.06	1.3	21
Diet 3	0.07	1.3	24
Diet 4	0.37	8.0	65

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.064	0.47	2.6
Commercial Milk (locally produced)	0.023	0.15	1.1
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.2	1.5	12
Beef (locally produced)	0.00017	0.0027	0.067
Leafy Vegetables (locally produced)	0.000061	0.00068	0.0063
Eggs (locally produced)	0.004	0.033	0.25
Cottage Cheese (locally produced)	0.0001	0.0014	0.014
Inhalation	0.0035	0.014	0.06
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.079	0.53	2.9
Diet 2	0.037	0.22	1.5
Diet 3	0.13	0.78	4.9

Excess Lifetime Risk [ ]			
Diet 1	3.1E-06	5.0E-05	7.6E-04
Diet 2	1.7E-06	2.1E-05	3.0E-04
Diet 3	6.1E-06	7.3E-05	9.7E-04
Diet 4	9.2E-06	1.4E-04	2.0E-03

Relative Risk [ ]			
Diet 1	1.0014	1.013	1.17
Diet 2	1.0006	1.0054	1.082
Diet 3	1.0021	1.02	1.24
Diet 4	1.0034	1.035	1.46

Probability of Causation [%]			
Diet 1	0.14	1.2	14
Diet 2	0.06	0.5	8
Diet 3	0.21	1.9	19
Diet 4	0.34	3.4	32

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**  
**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.071	0.49	2.9
Commercial Milk (locally produced)	0.024	0.16	1.2
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.2	1.6	12
Beef (locally produced)	0.00019	0.0031	0.072
Leafy Vegetables (locally produced)	0.00006	0.00066	0.0064
Eggs (locally produced)	0.0052	0.039	0.3
Cottage Cheese (locally produced)	0.00012	0.0014	0.015
Inhalation	0.0034	0.014	0.057
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.085	0.56	3.2
Diet 2	0.036	0.23	1.5
Diet 3	0.13	0.81	4.9

Excess Lifetime Risk [ ]			
Diet 1	3.5E-07	1.3E-05	3.0E-04
Diet 2	1.7E-07	5.9E-06	1.3E-04
Diet 3	6.6E-07	1.9E-05	4.7E-04
Diet 4	1.0E-06	3.3E-05	8.6E-04

Relative Risk [ ]			
Diet 1	1.00035	1.0083	1.21
Diet 2	1.00016	1.0039	1.084
Diet 3	1.0006	1.013	1.31
Diet 4	1.00088	1.023	1.62

Probability of Causation [%]			
Diet 1	0.04	0.8	17
Diet 2	0.02	0.4	8
Diet 3	0.06	1.2	24
Diet 4	0.09	2.3	38

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.34	1.9	11
Commercial Milk (locally produced)	0.1	0.66	4.4
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.8	6.3	42
Beef (locally produced)	0.00068	0.011	0.25
Leafy Vegetables (locally produced)	0.00026	0.0028	0.025
Eggs (locally produced)	0.02	0.14	0.97
Cottage Cheese (locally produced)	0.00054	0.0057	0.061
Inhalation	0.016	0.061	0.23
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.4	2.2	13
Diet 2	0.18	0.92	5.6
Diet 3	0.16	0.83	5

Excess Lifetime Risk [ ]			
Diet 1	1.3E-05	2.2E-04	2.7E-03
Diet 2	6.9E-06	9.0E-05	1.1E-03
Diet 3	6.9E-06	7.9E-05	9.9E-04
Diet 4	4.2E-05	6.0E-04	6.7E-03

Relative Risk [ ]			
Diet 1	1.0059	1.052	1.56
Diet 2	1.0025	1.022	1.25
Diet 3	1.0023	1.021	1.24
Diet 4	1.014	1.14	2.9

Probability of Causation [%]			
Diet 1	0.59	4.9	35
Diet 2	0.25	2.2	20
Diet 3	0.23	2.0	19
Diet 4	1.40	12.0	64

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.35	2	12
Commercial Milk (locally produced)	0.11	0.67	4.5
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.89	6.7	45
Beef (locally produced)	0.00081	0.013	0.3
Leafy Vegetables (locally produced)	0.00028	0.0028	0.025
Eggs (locally produced)	0.024	0.17	1.1
Cottage Cheese (locally produced)	0.00056	0.0058	0.06
Inhalation	0.016	0.061	0.23
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.42	2.3	14
Diet 2	0.18	0.97	5.6
Diet 3	0.15	0.87	5

Excess Lifetime Risk [ ]			
Diet 1	1.9E-06	5.3E-05	1.2E-03
Diet 2	8.3E-07	2.2E-05	5.4E-04
Diet 3	7.3E-07	2.0E-05	4.9E-04
Diet 4	4.6E-06	1.3E-04	3.5E-03

Relative Risk [ ]			
Diet 1	1.0016	1.035	1.78
Diet 2	1.00073	1.015	1.33
Diet 3	1.00067	1.013	1.32
Diet 4	1.0043	1.093	3.4

Probability of Causation [%]			
Diet 1	0.16	3.4	43
Diet 2	0.07	1.5	24
Diet 3	0.07	1.3	24
Diet 4	0.43	8.5	69

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	1.8	9.5
Commercial Milk (locally produced)	0.098	0.6	4
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.7	5.7	40
Beef (locally produced)	0.00061	0.01	0.21
Leafy Vegetables (locally produced)	0.00026	0.0026	0.023
Eggs (locally produced)	0.019	0.13	0.91
Cottage Cheese (locally produced)	0.00049	0.0053	0.053
Inhalation	0.016	0.06	0.24
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.35	2	11
Diet 2	0.16	0.84	5.2
Diet 3	0.16	0.84	5

Excess Lifetime Risk [ ]			
Diet 1	1.3E-05	1.9E-04	2.6E-03
Diet 2	6.8E-06	8.2E-05	1.1E-03
Diet 3	7.0E-06	7.9E-05	9.9E-04
Diet 4	3.7E-05	5.4E-04	7.3E-03

Relative Risk [ ]			
Diet 1	1.0056	1.047	1.53
Diet 2	1.0024	1.021	1.26
Diet 3	1.0023	1.021	1.24
Diet 4	1.014	1.13	2.8

Probability of Causation [%]			
Diet 1	0.56	4.5	34
Diet 2	0.24	2.0	20
Diet 3	0.23	2.0	19
Diet 4	1.35	11.7	63

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.32	1.8	9.9
Commercial Milk (locally produced)	0.1	0.61	4
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.76	6.1	43
Beef (locally produced)	0.00073	0.012	0.25
Leafy Vegetables (locally produced)	0.00027	0.0026	0.022
Eggs (locally produced)	0.023	0.15	1.1
Cottage Cheese (locally produced)	0.00053	0.0053	0.054
Inhalation	0.016	0.061	0.23
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.38	2.1	11
Diet 2	0.17	0.9	5.1
Diet 3	0.16	0.88	5

Excess Lifetime Risk [ ]			
Diet 1	1.5E-06	5.1E-05	1.1E-03
Diet 2	6.8E-07	2.2E-05	5.0E-04
Diet 3	7.3E-07	2.0E-05	4.9E-04
Diet 4	4.1E-06	1.2E-04	3.4E-03

Relative Risk [ ]			
Diet 1	1.0013	1.033	1.69
Diet 2	1.00064	1.014	1.29
Diet 3	1.00067	1.013	1.32
Diet 4	1.0037	1.089	3

Probability of Causation [%]			
Diet 1	0.13	3.2	40
Diet 2	0.06	1.4	23
Diet 3	0.07	1.3	24
Diet 4	0.37	8.1	66

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.34	2	12
Commercial Milk (locally produced)	0.11	0.68	4.4
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.86	6.5	44
Beef (locally produced)	0.00072	0.012	0.24
Leafy Vegetables (locally produced)	0.00028	0.003	0.026
Eggs (locally produced)	0.02	0.15	1
Cottage Cheese (locally produced)	0.00054	0.0061	0.063
Inhalation	0.019	0.07	0.28
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.41	2.3	13
Diet 2	0.19	0.96	5.8
Diet 3	0.17	0.85	5

Excess Lifetime Risk [ ]			
Diet 1	1.4E-05	2.3E-04	3.0E-03
Diet 2	7.4E-06	9.4E-05	1.2E-03
Diet 3	6.9E-06	8.0E-05	1.0E-03
Diet 4	4.4E-05	6.3E-04	7.9E-03

Relative Risk [ ]			
Diet 1	1.006	1.054	1.53
Diet 2	1.0027	1.023	1.26
Diet 3	1.0023	1.021	1.24
Diet 4	1.015	1.15	2.9

Probability of Causation [%]			
Diet 1	0.60	5.1	35
Diet 2	0.27	2.3	20
Diet 3	0.23	2.0	20
Diet 4	1.52	12.8	65

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.35	2.1	12
Commercial Milk (locally produced)	0.11	0.7	4.3
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.93	7	47
Beef (locally produced)	0.00081	0.014	0.29
Leafy Vegetables (locally produced)	0.00028	0.0029	0.026
Eggs (locally produced)	0.025	0.17	1.2
Cottage Cheese (locally produced)	0.00058	0.0061	0.06
Inhalation	0.019	0.071	0.27
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.43	2.5	14
Diet 2	0.19	1	5.9
Diet 3	0.16	0.89	5

Excess Lifetime Risk [ ]			
Diet 1	1.9E-06	5.6E-05	1.3E-03
Diet 2	8.1E-07	2.4E-05	5.8E-04
Diet 3	7.4E-07	2.1E-05	4.9E-04
Diet 4	4.7E-06	1.4E-04	3.5E-03

Relative Risk [ ]			
Diet 1	1.0016	1.038	1.82
Diet 2	1.00076	1.016	1.33
Diet 3	1.00069	1.013	1.32
Diet 4	1.0043	1.099	3.5

Probability of Causation [%]			
Diet 1	0.16	3.6	45
Diet 2	0.08	1.6	25
Diet 3	0.07	1.3	24
Diet 4	0.43	9.0	71

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.19	1.1	7
Commercial Milk (locally produced)	0.056	0.38	2.7
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.42	3.5	28
Beef (locally produced)	0.00039	0.0065	0.13
Leafy Vegetables (locally produced)	0.00014	0.0016	0.015
Eggs (locally produced)	0.012	0.08	0.62
Cottage Cheese (locally produced)	0.0003	0.0032	0.039
Inhalation	0.011	0.04	0.16
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.23	1.3	7.8
Diet 2	0.1	0.53	3.4
Diet 3	0.15	0.81	5

Excess Lifetime Risk [ ]			
Diet 1	8.2E-06	1.2E-04	1.7E-03
Diet 2	4.5E-06	5.3E-05	6.5E-04
Diet 3	6.6E-06	7.7E-05	9.8E-04
Diet 4	2.4E-05	3.3E-04	4.3E-03

Relative Risk [ ]			
Diet 1	1.0032	1.029	1.34
Diet 2	1.0015	1.013	1.14
Diet 3	1.0023	1.02	1.24
Diet 4	1.0083	1.078	2.2

Probability of Causation [%]			
Diet 1	0.32	2.9	25
Diet 2	0.15	1.3	12
Diet 3	0.23	2.0	19
Diet 4	0.82	7.2	54

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.2	1.1	7.3
Commercial Milk (locally produced)	0.056	0.39	2.7
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.44	3.8	29
Beef (locally produced)	0.00046	0.0078	0.16
Leafy Vegetables (locally produced)	0.00016	0.0016	0.015
Eggs (locally produced)	0.014	0.097	0.71
Cottage Cheese (locally produced)	0.00031	0.0033	0.039
Inhalation	0.011	0.04	0.17
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.24	1.3	8.4
Diet 2	0.11	0.57	3.6
Diet 3	0.15	0.85	4.9

Excess Lifetime Risk [ ]			
Diet 1	8.9E-07	2.9E-05	7.1E-04
Diet 2	4.6E-07	1.3E-05	3.1E-04
Diet 3	7.1E-07	2.0E-05	4.8E-04
Diet 4	2.6E-06	7.5E-05	2.1E-03

Relative Risk [ ]			
Diet 1	1.00084	1.02	1.46
Diet 2	1.00039	1.0093	1.18
Diet 3	1.00065	1.013	1.31
Diet 4	1.0022	1.056	2.2

Probability of Causation [%]			
Diet 1	0.08	1.9	32
Diet 2	0.04	0.9	15
Diet 3	0.07	1.3	24
Diet 4	0.22	5.3	54

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.31	1.7	10
Commercial Milk (locally produced)	0.093	0.59	3.9
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.72	5.5	39
Beef (locally produced)	0.00058	0.01	0.21
Leafy Vegetables (locally produced)	0.00023	0.0026	0.022
Eggs (locally produced)	0.019	0.13	0.87
Cottage Cheese (locally produced)	0.0005	0.0051	0.055
Inhalation	0.017	0.06	0.23
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.37	2	11
Diet 2	0.17	0.84	4.8
Diet 3	0.16	0.84	5.1

Excess Lifetime Risk [ ]			
Diet 1	1.3E-05	1.9E-04	2.5E-03
Diet 2	7.0E-06	8.0E-05	9.7E-04
Diet 3	6.9E-06	7.9E-05	9.9E-04
Diet 4	3.7E-05	5.4E-04	6.7E-03

Relative Risk [ ]			
Diet 1	1.0051	1.046	1.47
Diet 2	1.0022	1.02	1.22
Diet 3	1.0023	1.021	1.24
Diet 4	1.014	1.13	2.7

Probability of Causation [%]			
Diet 1	0.51	4.4	32
Diet 2	0.22	2.0	18
Diet 3	0.23	2.0	19
Diet 4	1.35	11.2	62

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**  
**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.34	1.8	11
Commercial Milk (locally produced)	0.095	0.61	3.8
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.79	5.9	43
Beef (locally produced)	0.00069	0.012	0.24
Leafy Vegetables (locally produced)	0.00025	0.0026	0.021
Eggs (locally produced)	0.021	0.15	1
Cottage Cheese (locally produced)	0.00052	0.0051	0.053
Inhalation	0.017	0.061	0.23
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.4	2.1	12
Diet 2	0.17	0.89	5.1
Diet 3	0.16	0.87	5

Excess Lifetime Risk [ ]			
Diet 1	1.3E-06	4.9E-05	1.1E-03
Diet 2	7.2E-07	2.0E-05	5.0E-04
Diet 3	7.4E-07	2.0E-05	4.8E-04
Diet 4	4.0E-06	1.2E-04	3.0E-03

Relative Risk [ ]			
Diet 1	1.0013	1.033	1.67
Diet 2	1.00065	1.014	1.3
Diet 3	1.00067	1.013	1.32
Diet 4	1.0038	1.092	3

Probability of Causation [%]			
Diet 1	0.13	3.2	40
Diet 2	0.07	1.4	23
Diet 3	0.07	1.3	24
Diet 4	0.38	8.4	66

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.18	1.1	5.4
Commercial Milk (locally produced)	0.059	0.36	2.4
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.46	3.6	24
Beef (locally produced)	0.00035	0.0063	0.14
Leafy Vegetables (locally produced)	0.00015	0.0016	0.013
Eggs (locally produced)	0.01	0.077	0.53
Cottage Cheese (locally produced)	0.00029	0.0031	0.033
Inhalation	0.0088	0.032	0.13
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.21	1.2	6.2
Diet 2	0.098	0.5	3
Diet 3	0.14	0.8	5

Excess Lifetime Risk [ ]			
Diet 1	7.9E-06	1.1E-04	1.5E-03
Diet 2	4.0E-06	4.9E-05	6.2E-04
Diet 3	6.4E-06	7.6E-05	9.8E-04
Diet 4	2.3E-05	3.3E-04	4.5E-03

Relative Risk [ ]			
Diet 1	1.0033	1.029	1.3
Diet 2	1.0014	1.012	1.16
Diet 3	1.0022	1.02	1.24
Diet 4	1.008	1.079	2

Probability of Causation [%]			
Diet 1	0.33	2.8	23
Diet 2	0.14	1.2	14
Diet 3	0.22	2.0	19
Diet 4	0.79	7.3	50

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.2	1.1	6.1
Commercial Milk (locally produced)	0.06	0.37	2.4
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.54	3.7	24
Beef (locally produced)	0.00041	0.0073	0.17
Leafy Vegetables (locally produced)	0.00016	0.0016	0.014
Eggs (locally produced)	0.013	0.088	0.63
Cottage Cheese (locally produced)	0.00035	0.0032	0.033
Inhalation	0.0092	0.033	0.12
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.23	1.2	6.8
Diet 2	0.1	0.54	3.1
Diet 3	0.14	0.84	4.9

Excess Lifetime Risk [ ]			
Diet 1	8.8E-07	3.0E-05	6.7E-04
Diet 2	4.4E-07	1.3E-05	2.9E-04
Diet 3	7.0E-07	2.0E-05	4.8E-04
Diet 4	2.7E-06	7.5E-05	1.9E-03

Relative Risk [ ]			
Diet 1	1.00082	1.02	1.41
Diet 2	1.00037	1.0084	1.17
Diet 3	1.00063	1.013	1.32
Diet 4	1.0024	1.052	2.3

Probability of Causation [%]			
Diet 1	0.08	1.9	29
Diet 2	0.04	0.8	15
Diet 3	0.06	1.3	24
Diet 4	0.24	5.0	56

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.2	1.3	7.1
Commercial Milk (locally produced)	0.07	0.44	2.9
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.45	4	31
Beef (locally produced)	0.00043	0.0074	0.14
Leafy Vegetables (locally produced)	0.00019	0.0019	0.016
Eggs (locally produced)	0.014	0.092	0.66
Cottage Cheese (locally produced)	0.00039	0.0039	0.039
Inhalation	0.013	0.047	0.18
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.25	1.5	8.1
Diet 2	0.12	0.63	3.7
Diet 3	0.15	0.83	5

Excess Lifetime Risk [ ]			
Diet 1	9.9E-06	1.4E-04	1.8E-03
Diet 2	5.1E-06	6.0E-05	7.9E-04
Diet 3	6.6E-06	7.8E-05	9.8E-04
Diet 4	2.7E-05	4.0E-04	5.5E-03

Relative Risk [ ]			
Diet 1	1.0043	1.034	1.37
Diet 2	1.0018	1.016	1.18
Diet 3	1.0022	1.02	1.24
Diet 4	1.01	1.098	2.4

Probability of Causation [%]			
Diet 1	0.43	3.3	27
Diet 2	0.18	1.5	15
Diet 3	0.22	2.0	19
Diet 4	1.04	9.0	57

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.22	1.3	6.9
Commercial Milk (locally produced)	0.075	0.46	2.8
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.49	4.3	36
Beef (locally produced)	0.00052	0.009	0.17
Leafy Vegetables (locally produced)	0.0002	0.0019	0.016
Eggs (locally produced)	0.017	0.11	0.81
Cottage Cheese (locally produced)	0.0004	0.0039	0.04
Inhalation	0.013	0.049	0.18
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.27	1.5	7.8
Diet 2	0.12	0.69	3.6
Diet 3	0.15	0.87	5

Excess Lifetime Risk [ ]			
Diet 1	1.2E-06	3.8E-05	7.4E-04
Diet 2	4.9E-07	1.6E-05	3.8E-04
Diet 3	7.2E-07	2.0E-05	4.8E-04
Diet 4	2.9E-06	8.6E-05	2.6E-03

Relative Risk [ ]			
Diet 1	1.00097	1.025	1.51
Diet 2	1.00049	1.011	1.21
Diet 3	1.00066	1.013	1.32
Diet 4	1.0026	1.068	2.4

Probability of Causation [%]			
Diet 1	0.10	2.4	34
Diet 2	0.05	1.0	17
Diet 3	0.07	1.3	24
Diet 4	0.26	6.4	58

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.37	2.2	12
Commercial Milk (locally produced)	0.12	0.76	5
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.93	7.1	49
Beef (locally produced)	0.00072	0.012	0.26
Leafy Vegetables (locally produced)	0.00032	0.0033	0.028
Eggs (locally produced)	0.022	0.16	1.1
Cottage Cheese (locally produced)	0.00066	0.0065	0.067
Inhalation	0.02	0.075	0.29
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.44	2.5	14
Diet 2	0.21	1.1	6.3
Diet 3	0.17	0.85	5.1

Excess Lifetime Risk [ ]			
Diet 1	1.6E-05	2.5E-04	3.0E-03
Diet 2	8.3E-06	1.0E-04	1.2E-03
Diet 3	7.1E-06	8.1E-05	1.0E-03
Diet 4	4.6E-05	6.9E-04	8.5E-03

Relative Risk [ ]			
Diet 1	1.0068	1.06	1.6
Diet 2	1.0029	1.026	1.28
Diet 3	1.0023	1.021	1.24
Diet 4	1.018	1.16	3.2

Probability of Causation [%]			
Diet 1	0.67	5.6	37
Diet 2	0.29	2.5	22
Diet 3	0.23	2.1	20
Diet 4	1.76	14.0	68

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.39	2.3	13
Commercial Milk (locally produced)	0.12	0.78	5
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	1	7.5	52
Beef (locally produced)	0.00088	0.015	0.31
Leafy Vegetables (locally produced)	0.00033	0.0032	0.026
Eggs (locally produced)	0.027	0.19	1.3
Cottage Cheese (locally produced)	0.00071	0.0065	0.07
Inhalation	0.021	0.076	0.28
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.47	2.6	15
Diet 2	0.21	1.1	6.4
Diet 3	0.16	0.89	5

Excess Lifetime Risk [ ]			
Diet 1	1.7E-06	6.4E-05	1.3E-03
Diet 2	8.8E-07	2.7E-05	6.0E-04
Diet 3	7.6E-07	2.1E-05	4.9E-04
Diet 4	5.1E-06	1.5E-04	3.5E-03

Relative Risk [ ]			
Diet 1	1.0017	1.041	1.83
Diet 2	1.00082	1.017	1.37
Diet 3	1.00069	1.013	1.32
Diet 4	1.0049	1.11	3.5

Probability of Causation [%]			
Diet 1	0.17	3.9	45
Diet 2	0.08	1.7	27
Diet 3	0.07	1.3	24
Diet 4	0.48	10.2	71

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.19	1.1	6.2
Commercial Milk (locally produced)	0.054	0.36	2.3
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.47	3.4	23
Beef (locally produced)	0.0004	0.0062	0.14
Leafy Vegetables (locally produced)	0.00014	0.0016	0.013
Eggs (locally produced)	0.01	0.08	0.54
Cottage Cheese (locally produced)	0.00028	0.0033	0.033
Inhalation	0.011	0.04	0.18
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.23	1.2	6.9
Diet 2	0.095	0.52	3.1
Diet 3	0.14	0.81	5

Excess Lifetime Risk [ ]			
Diet 1	7.7E-06	1.2E-04	1.6E-03
Diet 2	4.2E-06	5.0E-05	6.5E-04
Diet 3	6.4E-06	7.7E-05	9.8E-04
Diet 4	2.2E-05	3.5E-04	4.4E-03

Relative Risk [ ]			
Diet 1	1.003	1.028	1.28
Diet 2	1.0014	1.012	1.14
Diet 3	1.0022	1.02	1.24
Diet 4	1.0076	1.078	1.94

Probability of Causation [%]			
Diet 1	0.30	2.7	22
Diet 2	0.14	1.2	13
Diet 3	0.22	2.0	19
Diet 4	0.75	7.2	48

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.2	1.1	7
Commercial Milk (locally produced)	0.055	0.38	2.3
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.47	3.7	24
Beef (locally produced)	0.00046	0.0073	0.16
Leafy Vegetables (locally produced)	0.00015	0.0015	0.013
Eggs (locally produced)	0.013	0.093	0.65
Cottage Cheese (locally produced)	0.00032	0.0032	0.033
Inhalation	0.01	0.041	0.17
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.24	1.3	7.7
Diet 2	0.1	0.56	3.1
Diet 3	0.15	0.85	4.9

Excess Lifetime Risk [ ]			
Diet 1	1.0E-06	3.0E-05	7.3E-04
Diet 2	4.4E-07	1.3E-05	2.8E-04
Diet 3	7.1E-07	2.0E-05	4.8E-04
Diet 4	2.7E-06	7.7E-05	1.8E-03

Relative Risk [ ]			
Diet 1	1.00096	1.02	1.4
Diet 2	1.00042	1.009	1.17
Diet 3	1.00064	1.013	1.32
Diet 4	1.0027	1.053	2.5

Probability of Causation [%]			
Diet 1	0.10	2.0	28
Diet 2	0.04	0.9	14
Diet 3	0.06	1.3	24
Diet 4	0.27	5.0	60

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**  
**Receptor: Female born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.36	2	11
Commercial Milk (locally produced)	0.11	0.68	4.4
Commercial Milk (regionally mixed)	0.12	0.76	4.9
Goat Milk (locally produced)	0.87	6.3	44
Beef (locally produced)	0.00066	0.012	0.24
Leafy Vegetables (locally produced)	0.00028	0.003	0.025
Eggs (locally produced)	0.022	0.15	1
Cottage Cheese (locally produced)	0.0006	0.0059	0.061
Inhalation	0.019	0.065	0.24
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.43	2.2	13
Diet 2	0.2	0.96	5.5
Diet 3	0.16	0.84	5.1

Excess Lifetime Risk [ ]			
Diet 1	1.5E-05	2.2E-04	2.8E-03
Diet 2	8.1E-06	9.2E-05	1.1E-03
Diet 3	7.0E-06	8.0E-05	9.9E-04
Diet 4	4.4E-05	6.3E-04	7.8E-03

Relative Risk [ ]			
Diet 1	1.0059	1.053	1.54
Diet 2	1.0026	1.024	1.26
Diet 3	1.0023	1.021	1.24
Diet 4	1.017	1.15	2.9

Probability of Causation [%]			
Diet 1	0.59	5.1	35
Diet 2	0.26	2.3	21
Diet 3	0.23	2.0	19
Diet 4	1.64	12.7	66

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**

**Receptor: Male born in 1940**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.39	2.1	12
Commercial Milk (locally produced)	0.11	0.7	4.5
Commercial Milk (regionally mixed)	0.12	0.79	4.9
Goat Milk (locally produced)	0.98	6.8	48
Beef (locally produced)	0.0008	0.014	0.28
Leafy Vegetables (locally produced)	0.00029	0.0029	0.024
Eggs (locally produced)	0.025	0.17	1.1
Cottage Cheese (locally produced)	0.00061	0.0059	0.06
Inhalation	0.019	0.066	0.24
Mother's milk (mother on Diet 1)	--	--	--
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.45	2.4	14
Diet 2	0.2	1	5.9
Diet 3	0.16	0.88	5

Excess Lifetime Risk [ ]			
Diet 1	1.5E-06	5.6E-05	1.2E-03
Diet 2	8.0E-07	2.3E-05	5.4E-04
Diet 3	7.4E-07	2.1E-05	4.9E-04
Diet 4	4.4E-06	1.3E-04	3.3E-03

Relative Risk [ ]			
Diet 1	1.0015	1.038	1.77
Diet 2	1.00074	1.016	1.33
Diet 3	1.00068	1.013	1.32
Diet 4	1.0045	1.11	3.3

Probability of Causation [%]			
Diet 1	0.15	3.6	43
Diet 2	0.07	1.6	25
Diet 3	0.07	1.3	24
Diet 4	0.45	9.5	69

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	4.6	26	150
Commercial Milk (locally produced)	1.3	8.7	61
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	11	83	560
Beef (locally produced)	0.0076	0.13	2.6
Leafy Vegetables (locally produced)	0.0022	0.026	0.24
Eggs (locally produced)	0.24	1.8	13
Cottage Cheese (locally produced)	0.0059	0.066	0.78
Inhalation	0.12	0.45	1.7
Mother's milk (mother on Diet 1)	0.00083	0.029	0.79
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	5.2	29	170
Diet 2	1.9	12	75
Diet 3	0.4	1.7	9.5

Excess Lifetime Risk [ ]			
Diet 1	3.0E-04	5.0E-03	6.4E-02
Diet 2	1.5E-04	1.9E-03	2.6E-02
Diet 3	2.6E-05	2.6E-04	2.8E-03
Diet 4	8.6E-04	1.4E-02	1.6E-01

Relative Risk [ ]			
Diet 1	1.13	2.2	14
Diet 2	1.053	1.5	7.2
Diet 3	1.0082	1.071	1.73
Diet 4	1.34	4.1	52

Probability of Causation [%]			
Diet 1	11.13	54.4	93
Diet 2	5.00	33.1	86
Diet 3	0.82	6.6	42
Diet 4	25.48	75.4	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**  
**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	4.6	26	160
Commercial Milk (locally produced)	1.2	9	61
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	10	78	520
Beef (locally produced)	0.0077	0.13	2.7
Leafy Vegetables (locally produced)	0.0022	0.026	0.26
Eggs (locally produced)	0.28	2.1	14
Cottage Cheese (locally produced)	0.0055	0.066	0.83
Inhalation	0.12	0.45	1.6
Mother's milk (mother on Diet 1)	0.00083	0.029	0.79
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	5.4	29	190
Diet 2	2	13	77
Diet 3	0.36	1.7	9.4

Excess Lifetime Risk [ ]			
Diet 1	4.1E-05	1.3E-03	2.5E-02
Diet 2	1.9E-05	5.2E-04	1.1E-02
Diet 3	2.9E-06	7.4E-05	1.4E-03
Diet 4	1.2E-04	3.1E-03	6.8E-02

Relative Risk [ ]			
Diet 1	1.042	1.84	20
Diet 2	1.017	1.34	9.2
Diet 3	1.0025	1.044	1.99
Diet 4	1.12	3.3	48

Probability of Causation [%]			
Diet 1	4.01	45.6	95
Diet 2	1.67	25.6	89
Diet 3	0.25	4.2	50
Diet 4	10.99	69.7	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	5.2	33	170
Commercial Milk (locally produced)	1.7	11	67
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	13	100	650
Beef (locally produced)	0.0087	0.16	3.4
Leafy Vegetables (locally produced)	0.0029	0.032	0.29
Eggs (locally produced)	0.32	2.2	15
Cottage Cheese (locally produced)	0.0078	0.084	0.88
Inhalation	0.14	0.55	2
Mother's milk (mother on Diet 1)	0.0011	0.035	0.99
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	6.1	36	190
Diet 2	2.4	15	83
Diet 3	0.44	1.8	9.8

Excess Lifetime Risk [ ]			
Diet 1	3.9E-04	5.8E-03	8.1E-02
Diet 2	1.9E-04	2.3E-03	3.0E-02
Diet 3	2.8E-05	2.7E-04	2.9E-03
Diet 4	1.0E-03	1.7E-02	2.0E-01

Relative Risk [ ]			
Diet 1	1.15	2.5	18
Diet 2	1.06	1.63	8.7
Diet 3	1.0093	1.074	1.76
Diet 4	1.44	4.9	58

Probability of Causation [%]			
Diet 1	12.86	60.6	94
Diet 2	5.63	38.8	88
Diet 3	0.92	6.9	43
Diet 4	30.43	79.6	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	5.3	33	170
Commercial Milk (locally produced)	1.6	11	71
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	11	98	630
Beef (locally produced)	0.009	0.16	3.4
Leafy Vegetables (locally produced)	0.0028	0.033	0.28
Eggs (locally produced)	0.37	2.6	18
Cottage Cheese (locally produced)	0.0072	0.084	0.99
Inhalation	0.15	0.57	2
Mother's milk (mother on Diet 1)	0.0011	0.035	0.99
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	6.1	37	200
Diet 2	2.4	15	87
Diet 3	0.4	1.9	10

Excess Lifetime Risk [ ]			
Diet 1	5.4E-05	1.5E-03	3.0E-02
Diet 2	2.1E-05	6.1E-04	1.2E-02
Diet 3	3.0E-06	8.1E-05	1.5E-03
Diet 4	1.4E-04	3.7E-03	8.4E-02

Relative Risk [ ]			
Diet 1	1.049	2	25
Diet 2	1.019	1.41	10.4
Diet 3	1.0026	1.045	2
Diet 4	1.14	3.8	56

Probability of Causation [%]			
Diet 1	4.63	50.1	96
Diet 2	1.86	28.8	90
Diet 3	0.26	4.3	51
Diet 4	11.97	73.8	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.8	40
Commercial Milk (locally produced)	0.32	2.3	16
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.002	0.033	0.69
Leafy Vegetables (locally produced)	0.00061	0.0069	0.065
Eggs (locally produced)	0.059	0.46	3.5
Cottage Cheese (locally produced)	0.0017	0.017	0.22
Inhalation	0.032	0.12	0.44
Mother's milk (mother on Diet 1)	0.00021	0.0074	0.2
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.3	7.6	44
Diet 2	0.5	3.1	19
Diet 3	0.24	1.3	8.4

Excess Lifetime Risk [ ]			
Diet 1	8.3E-05	1.3E-03	1.7E-02
Diet 2	3.8E-05	4.9E-04	6.8E-03
Diet 3	1.8E-05	2.1E-04	2.6E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.031	1.31	4.6
Diet 2	1.013	1.13	2.6
Diet 3	1.0061	1.057	1.66
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	3.00	23.2	76
Diet 2	1.25	11.3	59
Diet 3	0.60	5.4	40
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.8	44
Commercial Milk (locally produced)	0.32	2.3	16
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0021	0.035	0.75
Leafy Vegetables (locally produced)	0.00059	0.0069	0.065
Eggs (locally produced)	0.07	0.53	3.7
Cottage Cheese (locally produced)	0.0015	0.017	0.22
Inhalation	0.03	0.12	0.45
Mother's milk (mother on Diet 1)	0.00021	0.0074	0.2
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.3	7.6	50
Diet 2	0.5	3.2	20
Diet 3	0.24	1.3	7.6

Excess Lifetime Risk [ ]			
Diet 1	9.9E-06	3.3E-04	6.1E-03
Diet 2	4.7E-06	1.4E-04	3.0E-03
Diet 3	2.3E-06	5.7E-05	1.2E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.0097	1.22	6.4
Diet 2	1.0042	1.087	3.3
Diet 3	1.0018	1.036	1.91
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.95	17.7	84
Diet 2	0.42	7.9	69
Diet 3	0.19	3.5	48
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.1	19	110
Commercial Milk (locally produced)	0.89	6	43
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.005	0.09	1.9
Leafy Vegetables (locally produced)	0.0017	0.019	0.17
Eggs (locally produced)	0.17	1.2	8.9
Cottage Cheese (locally produced)	0.0044	0.046	0.58
Inhalation	0.087	0.33	1.2
Mother's milk (mother on Diet 1)	0.00054	0.021	0.56
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	3.5	21	120
Diet 2	1.4	8	54
Diet 3	0.35	1.5	9

Excess Lifetime Risk [ ]			
Diet 1	2.2E-04	3.5E-03	4.6E-02
Diet 2	1.1E-04	1.3E-03	1.8E-02
Diet 3	2.3E-05	2.4E-04	2.7E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.091	1.91	10.2
Diet 2	1.035	1.35	5.2
Diet 3	1.0074	1.066	1.7
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	8.32	47.4	90
Diet 2	3.34	25.7	80
Diet 3	0.74	6.2	41
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.2	18	110
Commercial Milk (locally produced)	0.93	6.1	43
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0052	0.093	2.1
Leafy Vegetables (locally produced)	0.0017	0.019	0.17
Eggs (locally produced)	0.2	1.5	10
Cottage Cheese (locally produced)	0.0041	0.045	0.6
Inhalation	0.087	0.33	1.2
Mother's milk (mother on Diet 1)	0.00054	0.021	0.56
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	3.7	20	130
Diet 2	1.4	8.5	53
Diet 3	0.32	1.6	8.3

Excess Lifetime Risk [ ]			
Diet 1	2.7E-05	9.1E-04	1.8E-02
Diet 2	1.3E-05	3.8E-04	7.9E-03
Diet 3	2.7E-06	6.7E-05	1.3E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.029	1.6	14
Diet 2	1.011	1.23	6.6
Diet 3	1.0023	1.041	1.96
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	2.82	37.3	93
Diet 2	1.11	18.8	85
Diet 3	0.23	3.9	49
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.1	18	110
Commercial Milk (locally produced)	0.88	6	42
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	7.6	57	390
Beef (locally produced)	0.005	0.089	1.8
Leafy Vegetables (locally produced)	0.0017	0.019	0.16
Eggs (locally produced)	0.17	1.2	9
Cottage Cheese (locally produced)	0.0044	0.045	0.56
Inhalation	0.09	0.33	1.2
Mother's milk (mother on Diet 1)	0.00051	0.02	0.53
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	3.4	21	120
Diet 2	1.4	8	53
Diet 3	0.35	1.5	9

Excess Lifetime Risk [ ]			
Diet 1	2.1E-04	3.5E-03	4.4E-02
Diet 2	1.1E-04	1.3E-03	1.7E-02
Diet 3	2.3E-05	2.4E-04	2.7E-03
Diet 4	5.5E-04	9.5E-03	1.2E-01

Relative Risk [ ]			
Diet 1	1.09	1.89	10.1
Diet 2	1.034	1.34	5
Diet 3	1.0074	1.066	1.7
Diet 4	1.22	3.1	32

Probability of Causation [%]			
Diet 1	8.26	46.9	90
Diet 2	3.25	25.4	80
Diet 3	0.73	6.2	41
Diet 4	17.90	67.8	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**  
**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.2	18	110
Commercial Milk (locally produced)	0.91	6.1	41
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	7	54	350
Beef (locally produced)	0.0051	0.091	2
Leafy Vegetables (locally produced)	0.0017	0.018	0.17
Eggs (locally produced)	0.2	1.5	10
Cottage Cheese (locally produced)	0.0041	0.045	0.55
Inhalation	0.087	0.32	1.2
Mother's milk (mother on Diet 1)	0.00051	0.02	0.53
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	3.7	20	120
Diet 2	1.4	8.4	52
Diet 3	0.32	1.6	8.3

Excess Lifetime Risk [ ]			
Diet 1	2.6E-05	9.1E-04	1.7E-02
Diet 2	1.3E-05	3.7E-04	7.7E-03
Diet 3	2.7E-06	6.8E-05	1.3E-03
Diet 4	7.0E-05	2.2E-03	4.9E-02

Relative Risk [ ]			
Diet 1	1.029	1.59	14
Diet 2	1.011	1.22	6.5
Diet 3	1.0022	1.041	1.97
Diet 4	1.083	2.5	34

Probability of Causation [%]			
Diet 1	2.77	36.8	93
Diet 2	1.11	18.2	84
Diet 3	0.22	3.9	49
Diet 4	7.66	60.2	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.42	2.5	16
Commercial Milk (locally produced)	0.12	0.86	6.9
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	1	7.9	66
Beef (locally produced)	0.00068	0.013	0.26
Leafy Vegetables (locally produced)	0.00022	0.0027	0.028
Eggs (locally produced)	0.023	0.18	1.4
Cottage Cheese (locally produced)	0.00054	0.0065	0.086
Inhalation	0.013	0.048	0.2
Mother's milk (mother on Diet 1)	0.000072	0.0028	0.075
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.49	2.8	18
Diet 2	0.19	1.1	8.2
Diet 3	0.22	1.2	8.1

Excess Lifetime Risk [ ]			
Diet 1	3.3E-05	4.8E-04	7.6E-03
Diet 2	1.6E-05	2.0E-04	2.7E-03
Diet 3	1.7E-05	1.9E-04	2.6E-03
Diet 4	9.0E-05	1.3E-03	1.8E-02

Relative Risk [ ]			
Diet 1	1.011	1.12	2.7
Diet 2	1.0047	1.047	1.7
Diet 3	1.0057	1.054	1.65
Diet 4	1.029	1.3	6.3

Probability of Causation [%]			
Diet 1	1.12	10.4	62
Diet 2	0.47	4.5	41
Diet 3	0.57	5.1	39
Diet 4	2.83	23.2	84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.44	2.5	17
Commercial Milk (locally produced)	0.12	0.85	6.4
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	0.99	7.9	63
Beef (locally produced)	0.00072	0.013	0.27
Leafy Vegetables (locally produced)	0.00021	0.0027	0.025
Eggs (locally produced)	0.027	0.2	1.6
Cottage Cheese (locally produced)	0.00051	0.0065	0.09
Inhalation	0.014	0.049	0.2
Mother's milk (mother on Diet 1)	0.000072	0.0028	0.075
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.53	2.8	19
Diet 2	0.2	1.2	8.3
Diet 3	0.22	1.2	7.3

Excess Lifetime Risk [ ]			
Diet 1	3.7E-06	1.3E-04	2.8E-03
Diet 2	1.8E-06	5.1E-05	1.1E-03
Diet 3	2.2E-06	5.2E-05	1.1E-03
Diet 4	1.0E-05	3.0E-04	8.1E-03

Relative Risk [ ]			
Diet 1	1.0036	1.087	2.9
Diet 2	1.0015	1.032	1.85
Diet 3	1.0017	1.035	1.87
Diet 4	1.011	1.22	5.8

Probability of Causation [%]			
Diet 1	0.36	8.0	66
Diet 2	0.16	3.1	46
Diet 3	0.17	3.3	47
Diet 4	1.11	18.2	82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.003	0.034	0.39
Inhalation	0.064	0.24	0.92
Mother's milk (mother on Diet 3)	0.000047	0.0012	0.019
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.3	1.4	8.8

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.1E-05	2.3E-04	2.7E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0069	1.062	1.69
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.68	5.9	41
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.003	0.035	0.42
Inhalation	0.064	0.25	0.87
Mother's milk (mother on Diet 3)	0.000047	0.0012	0.019
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.28	1.5	8.1

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.5E-06	6.4E-05	1.3E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0021	1.039	1.94
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.21	3.8	49
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3	17	88
Commercial Milk (locally produced)	0.92	5.6	41
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	7.2	54	350
Beef (locally produced)	0.0046	0.087	1.7
Leafy Vegetables (locally produced)	0.0017	0.018	0.14
Eggs (locally produced)	0.17	1.2	8.5
Cottage Cheese (locally produced)	0.0042	0.042	0.47
Inhalation	0.087	0.31	1.2
Mother's milk (mother on Diet 1)	0.00053	0.019	0.51
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	3.5	19	97
Diet 2	1.4	7.5	52
Diet 3	0.34	1.5	9

Excess Lifetime Risk [ ]			
Diet 1	2.2E-04	3.1E-03	4.2E-02
Diet 2	1.1E-04	1.2E-03	1.7E-02
Diet 3	2.4E-05	2.4E-04	2.7E-03
Diet 4	5.4E-04	8.8E-03	1.1E-01

Relative Risk [ ]			
Diet 1	1.092	1.84	10.2
Diet 2	1.033	1.33	5
Diet 3	1.0076	1.066	1.7
Diet 4	1.22	3	31

Probability of Causation [%]			
Diet 1	8.41	45.5	90
Diet 2	3.21	24.8	80
Diet 3	0.75	6.2	41
Diet 4	17.82	66.2	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.2	17	93
Commercial Milk (locally produced)	0.91	5.6	41
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	6.9	53	330
Beef (locally produced)	0.0047	0.09	1.8
Leafy Vegetables (locally produced)	0.0018	0.018	0.15
Eggs (locally produced)	0.2	1.4	9.5
Cottage Cheese (locally produced)	0.0039	0.045	0.51
Inhalation	0.085	0.31	1.2
Mother's milk (mother on Diet 1)	0.00053	0.019	0.51
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	3.6	19	100
Diet 2	1.4	7.8	53
Diet 3	0.32	1.5	8.3

Excess Lifetime Risk [ ]			
Diet 1	2.6E-05	8.5E-04	1.5E-02
Diet 2	1.1E-05	3.4E-04	7.1E-03
Diet 3	2.7E-06	6.8E-05	1.3E-03
Diet 4	6.7E-05	2.1E-03	4.7E-02

Relative Risk [ ]			
Diet 1	1.024	1.56	13
Diet 2	1.01	1.21	6.2
Diet 3	1.0022	1.041	1.96
Diet 4	1.085	2.4	31

Probability of Causation [%]			
Diet 1	2.35	36.0	92
Diet 2	1.03	17.3	84
Diet 3	0.22	3.9	49
Diet 4	7.85	58.6	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.58	3.4	23
Commercial Milk (locally produced)	0.18	1.2	9.2
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	1.4	11	78
Beef (locally produced)	0.0011	0.017	0.33
Leafy Vegetables (locally produced)	0.00031	0.0035	0.037
Eggs (locally produced)	0.031	0.24	2
Cottage Cheese (locally produced)	0.0008	0.0087	0.12
Inhalation	0.017	0.066	0.28
Mother's milk (mother on Diet 1)	0.00012	0.0038	0.11
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.66	3.9	25
Diet 2	0.28	1.6	11
Diet 3	0.23	1.2	8.2

Excess Lifetime Risk [ ]			
Diet 1	4.4E-05	6.7E-04	9.5E-03
Diet 2	1.8E-05	2.6E-04	3.4E-03
Diet 3	1.7E-05	2.0E-04	2.6E-03
Diet 4	1.1E-04	1.9E-03	2.6E-02

Relative Risk [ ]			
Diet 1	1.016	1.16	3.2
Diet 2	1.0073	1.062	1.96
Diet 3	1.0058	1.054	1.65
Diet 4	1.047	1.41	7.4

Probability of Causation [%]			
Diet 1	1.55	14.1	69
Diet 2	0.72	5.9	49
Diet 3	0.58	5.1	39
Diet 4	4.45	28.9	86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.57	3.5	23
Commercial Milk (locally produced)	0.17	1.2	9
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	1.4	11	84
Beef (locally produced)	0.0011	0.017	0.36
Leafy Vegetables (locally produced)	0.0003	0.0037	0.035
Eggs (locally produced)	0.038	0.27	2.2
Cottage Cheese (locally produced)	0.00077	0.009	0.12
Inhalation	0.017	0.068	0.27
Mother's milk (mother on Diet 1)	0.00012	0.0038	0.11
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.69	4	26
Diet 2	0.29	1.6	12
Diet 3	0.22	1.3	7.4

Excess Lifetime Risk [ ]			
Diet 1	4.8E-06	1.8E-04	3.7E-03
Diet 2	2.6E-06	7.3E-05	1.6E-03
Diet 3	2.2E-06	5.4E-05	1.2E-03
Diet 4	1.5E-05	4.1E-04	1.0E-02

Relative Risk [ ]			
Diet 1	1.0054	1.11	3.7
Diet 2	1.0021	1.047	2.1
Diet 3	1.0018	1.035	1.89
Diet 4	1.013	1.3	8.1

Probability of Causation [%]			
Diet 1	0.54	10.1	73
Diet 2	0.21	4.5	53
Diet 3	0.18	3.4	47
Diet 4	1.29	23.3	87

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.002	0.019	0.22
Inhalation	0.038	0.14	0.56
Mother's milk (mother on Diet 3)	0.000038	0.001	0.017
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.27	1.3	8.4

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.9E-05	2.1E-04	2.6E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0062	1.058	1.66
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.62	5.5	40
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0018	0.02	0.23
Inhalation	0.04	0.14	0.52
Mother's milk (mother on Diet 3)	0.000038	0.001	0.017
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.25	1.4	7.6

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.4E-06	5.8E-05	1.2E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0019	1.037	1.92
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.19	3.6	48
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways  
Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways  
Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)  
Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.51	3.2	21
Commercial Milk (locally produced)	0.17	1.1	8.6
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	1.3	10	84
Beef (locally produced)	0.00089	0.016	0.38
Leafy Vegetables (locally produced)	0.00035	0.0035	0.031
Eggs (locally produced)	0.029	0.22	1.9
Cottage Cheese (locally produced)	0.00072	0.0086	0.11
Inhalation	0.017	0.064	0.25
Mother's milk (mother on Diet 1)	0.000099	0.0038	0.097
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.58	3.5	24
Diet 2	0.25	1.5	11
Diet 3	0.22	1.2	8.2

Excess Lifetime Risk [ ]			
Diet 1	4.0E-05	6.5E-04	9.3E-03
Diet 2	1.7E-05	2.5E-04	3.8E-03
Diet 3	1.7E-05	2.0E-04	2.6E-03
Diet 4	1.1E-04	1.8E-03	2.3E-02

Relative Risk [ ]			
Diet 1	1.015	1.15	2.7
Diet 2	1.0064	1.062	1.82
Diet 3	1.0057	1.054	1.65
Diet 4	1.042	1.4	7.2

Probability of Causation [%]			
Diet 1	1.51	13.2	63
Diet 2	0.64	5.8	45
Diet 3	0.57	5.2	39
Diet 4	4.06	28.3	86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.52	3.2	23
Commercial Milk (locally produced)	0.16	1.1	8.7
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	1.3	9.9	81
Beef (locally produced)	0.001	0.017	0.4
Leafy Vegetables (locally produced)	0.00034	0.0033	0.033
Eggs (locally produced)	0.033	0.26	1.9
Cottage Cheese (locally produced)	0.00071	0.0089	0.12
Inhalation	0.015	0.064	0.24
Mother's milk (mother on Diet 1)	0.000099	0.0038	0.097
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.61	3.6	25
Diet 2	0.25	1.5	12
Diet 3	0.22	1.3	7.4

Excess Lifetime Risk [ ]			
Diet 1	5.2E-06	1.6E-04	3.3E-03
Diet 2	2.1E-06	6.5E-05	1.4E-03
Diet 3	2.2E-06	5.4E-05	1.2E-03
Diet 4	1.4E-05	4.0E-04	9.9E-03

Relative Risk [ ]			
Diet 1	1.0045	1.11	3.6
Diet 2	1.002	1.043	2.1
Diet 3	1.0017	1.035	1.89
Diet 4	1.013	1.29	8.8

Probability of Causation [%]			
Diet 1	0.45	10.0	72
Diet 2	0.20	4.2	53
Diet 3	0.17	3.4	47
Diet 4	1.29	22.2	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0028	0.028	0.32
Inhalation	0.059	0.21	0.8
Mother's milk (mother on Diet 3)	0.000046	0.0012	0.017
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.3	1.4	8.6

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.1E-05	2.2E-04	2.7E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0067	1.061	1.68
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.67	5.8	40
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0026	0.03	0.34
Inhalation	0.059	0.21	0.79
Mother's milk (mother on Diet 3)	0.000046	0.0012	0.017
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.28	1.4	7.9

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.5E-06	6.2E-05	1.3E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.002	1.038	1.93
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.20	3.7	48
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.8	16	93
Commercial Milk (locally produced)	0.86	5.5	38
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	7	52	340
Beef (locally produced)	0.0044	0.078	1.5
Leafy Vegetables (locally produced)	0.0015	0.017	0.15
Eggs (locally produced)	0.15	1.1	8.4
Cottage Cheese (locally produced)	0.004	0.042	0.49
Inhalation	0.084	0.31	1.2
Mother's milk (mother on Diet 1)	0.00053	0.018	0.51
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	3.2	18	100
Diet 2	1.3	7.3	49
Diet 3	0.34	1.5	9

Excess Lifetime Risk [ ]			
Diet 1	2.0E-04	3.0E-03	3.8E-02
Diet 2	8.7E-05	1.2E-03	1.6E-02
Diet 3	2.3E-05	2.4E-04	2.7E-03
Diet 4	5.5E-04	9.0E-03	1.0E-01

Relative Risk [ ]			
Diet 1	1.084	1.77	9.3
Diet 2	1.033	1.3	4.9
Diet 3	1.0074	1.065	1.7
Diet 4	1.23	2.9	31

Probability of Causation [%]			
Diet 1	7.76	43.5	89
Diet 2	3.19	23.1	79
Diet 3	0.74	6.1	41
Diet 4	18.31	65.9	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.8	16	95
Commercial Milk (locally produced)	0.84	5.6	37
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	6.9	50	340
Beef (locally produced)	0.0047	0.082	1.6
Leafy Vegetables (locally produced)	0.0015	0.016	0.15
Eggs (locally produced)	0.19	1.3	9.2
Cottage Cheese (locally produced)	0.0037	0.043	0.49
Inhalation	0.086	0.31	1.2
Mother's milk (mother on Diet 1)	0.00053	0.018	0.51
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	3.3	18	110
Diet 2	1.3	7.7	50
Diet 3	0.32	1.6	8.4

Excess Lifetime Risk [ ]			
Diet 1	2.5E-05	8.1E-04	1.4E-02
Diet 2	1.2E-05	3.3E-04	6.7E-03
Diet 3	2.7E-06	6.8E-05	1.3E-03
Diet 4	6.9E-05	1.9E-03	4.2E-02

Relative Risk [ ]			
Diet 1	1.026	1.52	14
Diet 2	1.011	1.2	5.8
Diet 3	1.0022	1.041	1.95
Diet 4	1.067	2.4	32

Probability of Causation [%]			
Diet 1	2.52	34.1	93
Diet 2	1.05	16.9	83
Diet 3	0.22	3.9	49
Diet 4	6.31	57.7	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.4	2.5	15
Commercial Milk (locally produced)	0.13	0.82	6.5
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	1	7.9	63
Beef (locally produced)	0.00068	0.012	0.27
Leafy Vegetables (locally produced)	0.00022	0.0026	0.026
Eggs (locally produced)	0.023	0.17	1.4
Cottage Cheese (locally produced)	0.00057	0.0066	0.077
Inhalation	0.013	0.048	0.2
Mother's milk (mother on Diet 1)	0.000072	0.0028	0.077
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.46	2.8	17
Diet 2	0.2	1.1	8.3
Diet 3	0.22	1.2	8.1

Excess Lifetime Risk [ ]			
Diet 1	3.3E-05	4.7E-04	7.1E-03
Diet 2	1.5E-05	1.8E-04	2.8E-03
Diet 3	1.7E-05	1.9E-04	2.6E-03
Diet 4	7.8E-05	1.3E-03	1.7E-02

Relative Risk [ ]			
Diet 1	1.011	1.12	2.5
Diet 2	1.0045	1.047	1.68
Diet 3	1.0056	1.054	1.65
Diet 4	1.031	1.31	5.9

Probability of Causation [%]			
Diet 1	1.08	10.7	60
Diet 2	0.45	4.5	40
Diet 3	0.56	5.1	39
Diet 4	3.01	23.7	82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.4	2.4	17
Commercial Milk (locally produced)	0.13	0.84	6.6
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	0.96	7.9	60
Beef (locally produced)	0.00074	0.013	0.28
Leafy Vegetables (locally produced)	0.00022	0.0025	0.026
Eggs (locally produced)	0.028	0.2	1.5
Cottage Cheese (locally produced)	0.00054	0.0065	0.083
Inhalation	0.013	0.05	0.2
Mother's milk (mother on Diet 1)	0.000072	0.0028	0.077
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.47	2.7	18
Diet 2	0.2	1.2	8.5
Diet 3	0.22	1.2	7.3

Excess Lifetime Risk [ ]			
Diet 1	3.6E-06	1.2E-04	2.6E-03
Diet 2	1.6E-06	5.0E-05	1.1E-03
Diet 3	2.2E-06	5.3E-05	1.1E-03
Diet 4	1.1E-05	3.2E-04	7.0E-03

Relative Risk [ ]			
Diet 1	1.0034	1.084	2.9
Diet 2	1.0014	1.033	1.88
Diet 3	1.0017	1.035	1.88
Diet 4	1.0091	1.22	6.4

Probability of Causation [%]			
Diet 1	0.34	7.7	65
Diet 2	0.14	3.2	46
Diet 3	0.17	3.3	47
Diet 4	0.91	18.1	84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.7	15	85
Commercial Milk (locally produced)	0.76	4.9	34
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	6.3	47	290
Beef (locally produced)	0.004	0.072	1.4
Leafy Vegetables (locally produced)	0.0014	0.016	0.14
Eggs (locally produced)	0.14	1	7.3
Cottage Cheese (locally produced)	0.0035	0.038	0.48
Inhalation	0.08	0.29	1.1
Mother's milk (mother on Diet 1)	0.00048	0.016	0.43
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	3.1	16	96
Diet 2	1.2	6.5	43
Diet 3	0.34	1.5	9

Excess Lifetime Risk [ ]			
Diet 1	1.8E-04	2.8E-03	3.7E-02
Diet 2	9.3E-05	1.1E-03	1.5E-02
Diet 3	2.3E-05	2.4E-04	2.7E-03
Diet 4	4.7E-04	7.8E-03	9.2E-02

Relative Risk [ ]			
Diet 1	1.072	1.71	8.6
Diet 2	1.028	1.28	4.4
Diet 3	1.007	1.064	1.7
Diet 4	1.19	2.7	28

Probability of Causation [%]			
Diet 1	6.72	41.2	88
Diet 2	2.74	22.1	77
Diet 3	0.69	6.0	41
Diet 4	15.89	63.0	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.8	15	89
Commercial Milk (locally produced)	0.76	5	34
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	6.2	45	300
Beef (locally produced)	0.0041	0.077	1.4
Leafy Vegetables (locally produced)	0.0014	0.015	0.13
Eggs (locally produced)	0.17	1.2	7.8
Cottage Cheese (locally produced)	0.0031	0.038	0.43
Inhalation	0.08	0.29	1
Mother's milk (mother on Diet 1)	0.00048	0.016	0.43
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	3.3	16	100
Diet 2	1.2	6.9	44
Diet 3	0.32	1.5	8.2

Excess Lifetime Risk [ ]			
Diet 1	2.4E-05	7.2E-04	1.4E-02
Diet 2	1.1E-05	2.9E-04	6.2E-03
Diet 3	2.7E-06	6.7E-05	1.3E-03
Diet 4	6.2E-05	1.7E-03	4.0E-02

Relative Risk [ ]			
Diet 1	1.02	1.49	12
Diet 2	1.0087	1.18	5.4
Diet 3	1.0022	1.04	1.95
Diet 4	1.071	2.3	28

Probability of Causation [%]			
Diet 1	1.97	32.6	91
Diet 2	0.86	15.5	81
Diet 3	0.22	3.8	49
Diet 4	6.59	56.2	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.2	38
Commercial Milk (locally produced)	0.32	2.1	15
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	2.7	20	140
Beef (locally produced)	0.0017	0.031	0.57
Leafy Vegetables (locally produced)	0.00058	0.0065	0.062
Eggs (locally produced)	0.059	0.43	3.2
Cottage Cheese (locally produced)	0.0014	0.016	0.2
Inhalation	0.032	0.12	0.47
Mother's milk (mother on Diet 1)	0.0002	0.0068	0.2
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.3	7	42
Diet 2	0.5	2.8	20
Diet 3	0.25	1.3	8.4

Excess Lifetime Risk [ ]			
Diet 1	7.9E-05	1.2E-03	1.6E-02
Diet 2	3.6E-05	4.6E-04	6.5E-03
Diet 3	1.9E-05	2.1E-04	2.6E-03
Diet 4	2.1E-04	3.3E-03	3.9E-02

Relative Risk [ ]			
Diet 1	1.03	1.29	4.5
Diet 2	1.013	1.12	2.5
Diet 3	1.0061	1.057	1.66
Diet 4	1.082	1.73	12

Probability of Causation [%]			
Diet 1	2.94	21.7	76
Diet 2	1.23	10.3	57
Diet 3	0.61	5.4	40
Diet 4	7.47	40.8	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.1	38
Commercial Milk (locally produced)	0.32	2.1	15
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	2.6	19	130
Beef (locally produced)	0.0018	0.032	0.64
Leafy Vegetables (locally produced)	0.00056	0.0063	0.061
Eggs (locally produced)	0.068	0.49	3.6
Cottage Cheese (locally produced)	0.0013	0.017	0.2
Inhalation	0.033	0.12	0.45
Mother's milk (mother on Diet 1)	0.0002	0.0068	0.2
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.4	6.9	43
Diet 2	0.5	2.9	20
Diet 3	0.24	1.3	7.5

Excess Lifetime Risk [ ]			
Diet 1	9.6E-06	3.0E-04	6.1E-03
Diet 2	4.8E-06	1.2E-04	2.6E-03
Diet 3	2.3E-06	5.6E-05	1.2E-03
Diet 4	2.7E-05	7.0E-04	1.7E-02

Relative Risk [ ]			
Diet 1	1.0089	1.2	5.8
Diet 2	1.0037	1.079	3
Diet 3	1.0019	1.036	1.91
Diet 4	1.026	1.52	12

Probability of Causation [%]			
Diet 1	0.88	16.3	81
Diet 2	0.37	7.2	65
Diet 3	0.19	3.5	48
Diet 4	2.51	33.2	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0017	0.017	0.21
Inhalation	0.036	0.13	0.51
Mother's milk (mother on Diet 3)	0.000038	0.001	0.017
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.25	1.3	8.4

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.9E-05	2.1E-04	2.6E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0061	1.058	1.66
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.61	5.4	40
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0015	0.017	0.2
Inhalation	0.035	0.13	0.48
Mother's milk (mother on Diet 3)	0.000038	0.001	0.017
Prenatal exposure (mother on Diet 3)	--	--	--
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.25	1.3	7.6

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.3E-06	5.7E-05	1.2E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0019	1.036	1.92
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.19	3.5	48
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.3	7.6	43
Commercial Milk (locally produced)	0.38	2.5	18
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	3.3	23	160
Beef (locally produced)	0.002	0.037	0.81
Leafy Vegetables (locally produced)	0.00078	0.0076	0.069
Eggs (locally produced)	0.068	0.51	3.5
Cottage Cheese (locally produced)	0.0018	0.019	0.22
Inhalation	0.041	0.16	0.57
Mother's milk (mother on Diet 1)	0.00023	0.0084	0.24
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.4	8.6	47
Diet 2	0.6	3.3	21
Diet 3	0.26	1.3	8.5

Excess Lifetime Risk [ ]			
Diet 1	8.9E-05	1.4E-03	2.0E-02
Diet 2	4.6E-05	5.6E-04	7.9E-03
Diet 3	1.9E-05	2.1E-04	2.6E-03
Diet 4	2.6E-04	3.9E-03	5.1E-02

Relative Risk [ ]			
Diet 1	1.039	1.36	4.5
Diet 2	1.015	1.14	2.7
Diet 3	1.0063	1.059	1.67
Diet 4	1.093	1.88	14

Probability of Causation [%]			
Diet 1	3.75	26.6	78
Diet 2	1.45	12.5	63
Diet 3	0.63	5.5	40
Diet 4	8.50	46.9	93

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.3	7.4	46
Commercial Milk (locally produced)	0.4	2.5	17
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	2.9	22	150
Beef (locally produced)	0.0021	0.039	0.86
Leafy Vegetables (locally produced)	0.00072	0.0078	0.07
Eggs (locally produced)	0.078	0.59	4.2
Cottage Cheese (locally produced)	0.0017	0.019	0.24
Inhalation	0.042	0.16	0.57
Mother's milk (mother on Diet 1)	0.00023	0.0084	0.24
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.5	8.3	51
Diet 2	0.62	3.4	21
Diet 3	0.25	1.4	7.7

Excess Lifetime Risk [ ]			
Diet 1	1.1E-05	3.8E-04	7.9E-03
Diet 2	5.6E-06	1.5E-04	3.4E-03
Diet 3	2.4E-06	5.9E-05	1.2E-03
Diet 4	3.4E-05	8.9E-04	2.0E-02

Relative Risk [ ]			
Diet 1	1.011	1.25	6.3
Diet 2	1.0047	1.098	3.3
Diet 3	1.002	1.037	1.92
Diet 4	1.031	1.63	17

Probability of Causation [%]			
Diet 1	1.12	20.3	84
Diet 2	0.46	8.9	69
Diet 3	0.20	3.6	48
Diet 4	3.05	38.5	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.4	8.4	46
Commercial Milk (locally produced)	0.44	2.8	19
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	3.6	27	190
Beef (locally produced)	0.0022	0.041	0.95
Leafy Vegetables (locally produced)	0.00078	0.0088	0.081
Eggs (locally produced)	0.076	0.58	4.1
Cottage Cheese (locally produced)	0.0021	0.021	0.26
Inhalation	0.047	0.18	0.67
Mother's milk (mother on Diet 1)	0.00028	0.009	0.25
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.7	9.3	51
Diet 2	0.69	3.8	24
Diet 3	0.28	1.3	8.6

Excess Lifetime Risk [ ]			
Diet 1	1.0E-04	1.6E-03	2.0E-02
Diet 2	4.8E-05	6.2E-04	8.0E-03
Diet 3	2.0E-05	2.2E-04	2.6E-03
Diet 4	2.9E-04	4.6E-03	5.3E-02

Relative Risk [ ]			
Diet 1	1.043	1.42	5.2
Diet 2	1.016	1.16	3
Diet 3	1.0064	1.06	1.67
Diet 4	1.11	2	16

Probability of Causation [%]			
Diet 1	4.16	29.3	81
Diet 2	1.61	13.9	66
Diet 3	0.64	5.6	40
Diet 4	9.72	50.2	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.5	8.3	49
Commercial Milk (locally produced)	0.43	2.9	18
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	3.5	26	180
Beef (locally produced)	0.0024	0.044	1.1
Leafy Vegetables (locally produced)	0.00074	0.0086	0.081
Eggs (locally produced)	0.093	0.66	4.7
Cottage Cheese (locally produced)	0.0019	0.022	0.26
Inhalation	0.044	0.18	0.63
Mother's milk (mother on Diet 1)	0.00028	0.009	0.25
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.7	9.4	53
Diet 2	0.69	3.9	24
Diet 3	0.27	1.4	7.8

Excess Lifetime Risk [ ]			
Diet 1	1.4E-05	4.0E-04	8.0E-03
Diet 2	6.0E-06	1.7E-04	3.6E-03
Diet 3	2.4E-06	6.0E-05	1.2E-03
Diet 4	4.0E-05	9.8E-04	2.4E-02

Relative Risk [ ]			
Diet 1	1.014	1.27	7.3
Diet 2	1.0054	1.11	3.6
Diet 3	1.002	1.038	1.93
Diet 4	1.04	1.73	18

Probability of Causation [%]			
Diet 1	1.34	21.0	86
Diet 2	0.54	9.6	72
Diet 3	0.20	3.6	48
Diet 4	3.84	42.0	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.91	5	26
Commercial Milk (locally produced)	0.27	1.6	13
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0014	0.026	0.51
Leafy Vegetables (locally produced)	0.00056	0.0055	0.044
Eggs (locally produced)	0.051	0.36	2.5
Cottage Cheese (locally produced)	0.0012	0.013	0.14
Inhalation	0.03	0.11	0.43
Mother's milk (mother on Diet 1)	0.00016	0.0057	0.16
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1	5.5	29
Diet 2	0.42	2.3	15
Diet 3	0.25	1.3	8.2

Excess Lifetime Risk [ ]			
Diet 1	7.3E-05	9.6E-04	1.4E-02
Diet 2	3.4E-05	3.6E-04	5.6E-03
Diet 3	1.9E-05	2.0E-04	2.6E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.028	1.24	3.7
Diet 2	1.01	1.098	2.4
Diet 3	1.0061	1.056	1.66
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	2.70	19.1	73
Diet 2	1.02	9.0	58
Diet 3	0.61	5.3	40
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.93	5	27
Commercial Milk (locally produced)	0.28	1.7	13
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0016	0.026	0.51
Leafy Vegetables (locally produced)	0.00057	0.0054	0.047
Eggs (locally produced)	0.062	0.41	2.8
Cottage Cheese (locally produced)	0.0012	0.014	0.15
Inhalation	0.03	0.11	0.42
Mother's milk (mother on Diet 1)	0.00016	0.0057	0.16
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.1	5.6	31
Diet 2	0.45	2.3	15
Diet 3	0.24	1.3	7.5

Excess Lifetime Risk [ ]			
Diet 1	7.0E-06	2.6E-04	4.6E-03
Diet 2	3.5E-06	9.9E-05	2.2E-03
Diet 3	2.3E-06	5.6E-05	1.2E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.0082	1.17	4.5
Diet 2	1.0034	1.066	2.6
Diet 3	1.0019	1.035	1.92
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.82	14.5	78
Diet 2	0.34	6.2	61
Diet 3	0.19	3.4	48
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.6	35
Commercial Milk (locally produced)	0.34	2.2	15
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	2.9	21	140
Beef (locally produced)	0.0019	0.033	0.66
Leafy Vegetables (locally produced)	0.00062	0.007	0.063
Eggs (locally produced)	0.063	0.44	3.4
Cottage Cheese (locally produced)	0.0016	0.017	0.19
Inhalation	0.04	0.14	0.56
Mother's milk (mother on Diet 1)	0.00022	0.0072	0.22
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.2	7.4	39
Diet 2	0.57	3	20
Diet 3	0.26	1.3	8.4

Excess Lifetime Risk [ ]			
Diet 1	8.1E-05	1.2E-03	1.6E-02
Diet 2	4.3E-05	4.9E-04	6.9E-03
Diet 3	1.9E-05	2.1E-04	2.6E-03
Diet 4	2.1E-04	3.4E-03	4.0E-02

Relative Risk [ ]			
Diet 1	1.034	1.32	4.6
Diet 2	1.014	1.13	2.6
Diet 3	1.0062	1.058	1.67
Diet 4	1.095	1.79	12

Probability of Causation [%]			
Diet 1	3.30	24.0	78
Diet 2	1.36	11.3	62
Diet 3	0.62	5.5	40
Diet 4	8.70	43.9	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.6	37
Commercial Milk (locally produced)	0.35	2.2	14
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	2.7	20	140
Beef (locally produced)	0.0019	0.034	0.74
Leafy Vegetables (locally produced)	0.00061	0.0066	0.064
Eggs (locally produced)	0.07	0.51	3.5
Cottage Cheese (locally produced)	0.0015	0.017	0.2
Inhalation	0.038	0.14	0.54
Mother's milk (mother on Diet 1)	0.00022	0.0072	0.22
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.3	7.4	41
Diet 2	0.54	3.1	20
Diet 3	0.25	1.4	7.6

Excess Lifetime Risk [ ]			
Diet 1	1.0E-05	3.2E-04	6.2E-03
Diet 2	4.5E-06	1.3E-04	2.9E-03
Diet 3	2.4E-06	5.9E-05	1.2E-03
Diet 4	2.8E-05	7.8E-04	1.9E-02

Relative Risk [ ]			
Diet 1	1.009	1.22	5.8
Diet 2	1.004	1.086	3.1
Diet 3	1.0019	1.037	1.93
Diet 4	1.027	1.56	14

Probability of Causation [%]			
Diet 1	0.89	17.9	82
Diet 2	0.40	7.9	68
Diet 3	0.19	3.6	48
Diet 4	2.66	35.8	93

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.5	9.1	46
Commercial Milk (locally produced)	0.47	3	20
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	3.8	28	190
Beef (locally produced)	0.0024	0.043	0.91
Leafy Vegetables (locally produced)	0.00084	0.0094	0.08
Eggs (locally produced)	0.082	0.61	4.2
Cottage Cheese (locally produced)	0.0022	0.023	0.26
Inhalation	0.05	0.19	0.74
Mother's milk (mother on Diet 1)	0.00031	0.0096	0.29
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.8	10	51
Diet 2	0.73	4.1	24
Diet 3	0.28	1.4	8.7

Excess Lifetime Risk [ ]			
Diet 1	1.1E-04	1.7E-03	2.1E-02
Diet 2	5.4E-05	6.5E-04	8.7E-03
Diet 3	2.0E-05	2.2E-04	2.6E-03
Diet 4	3.1E-04	4.9E-03	5.8E-02

Relative Risk [ ]			
Diet 1	1.046	1.44	5.4
Diet 2	1.018	1.18	3
Diet 3	1.0065	1.06	1.68
Diet 4	1.12	2.1	17

Probability of Causation [%]			
Diet 1	4.39	30.3	81
Diet 2	1.74	15.0	67
Diet 3	0.65	5.7	40
Diet 4	10.62	51.7	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.6	8.9	46
Commercial Milk (locally produced)	0.48	3	18
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	3.5	27	190
Beef (locally produced)	0.0026	0.045	0.98
Leafy Vegetables (locally produced)	0.00083	0.0091	0.078
Eggs (locally produced)	0.099	0.69	4.9
Cottage Cheese (locally produced)	0.0021	0.023	0.27
Inhalation	0.051	0.2	0.71
Mother's milk (mother on Diet 1)	0.00031	0.0096	0.29
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.8	10	53
Diet 2	0.74	4.3	23
Diet 3	0.27	1.4	7.9

Excess Lifetime Risk [ ]			
Diet 1	1.5E-05	4.3E-04	8.4E-03
Diet 2	6.4E-06	1.8E-04	3.8E-03
Diet 3	2.4E-06	6.1E-05	1.3E-03
Diet 4	4.0E-05	1.0E-03	2.4E-02

Relative Risk [ ]			
Diet 1	1.014	1.29	7.6
Diet 2	1.0057	1.11	3.6
Diet 3	1.002	1.038	1.93
Diet 4	1.041	1.78	17

Probability of Causation [%]			
Diet 1	1.33	22.2	87
Diet 2	0.57	10.2	72
Diet 3	0.20	3.7	48
Diet 4	3.94	43.8	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.88	5	29
Commercial Milk (locally produced)	0.25	1.7	11
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	2.1	16	110
Beef (locally produced)	0.0014	0.025	0.48
Leafy Vegetables (locally produced)	0.00047	0.0053	0.048
Eggs (locally produced)	0.046	0.35	2.5
Cottage Cheese (locally produced)	0.0011	0.013	0.15
Inhalation	0.031	0.11	0.44
Mother's milk (mother on Diet 1)	0.00017	0.0057	0.15
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1	5.6	33
Diet 2	0.4	2.3	14
Diet 3	0.25	1.3	8.4

Excess Lifetime Risk [ ]			
Diet 1	6.3E-05	9.5E-04	1.3E-02
Diet 2	3.1E-05	3.8E-04	5.0E-03
Diet 3	1.9E-05	2.1E-04	2.6E-03
Diet 4	1.6E-04	2.6E-03	3.2E-02

Relative Risk [ ]			
Diet 1	1.025	1.24	3.5
Diet 2	1.01	1.097	2.1
Diet 3	1.006	1.057	1.66
Diet 4	1.062	1.61	9.8

Probability of Causation [%]			
Diet 1	2.44	19.0	71
Diet 2	1.03	8.9	52
Diet 3	0.60	5.4	40
Diet 4	5.85	38.0	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.92	5	30
Commercial Milk (locally produced)	0.25	1.7	11
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	2	15	100
Beef (locally produced)	0.0015	0.026	0.52
Leafy Vegetables (locally produced)	0.00046	0.0051	0.047
Eggs (locally produced)	0.055	0.39	2.7
Cottage Cheese (locally produced)	0.0011	0.013	0.15
Inhalation	0.03	0.12	0.43
Mother's milk (mother on Diet 1)	0.00017	0.0057	0.15
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.1	5.6	34
Diet 2	0.4	2.4	15
Diet 3	0.24	1.3	7.5

Excess Lifetime Risk [ ]			
Diet 1	8.0E-06	2.4E-04	5.1E-03
Diet 2	3.8E-06	1.0E-04	2.0E-03
Diet 3	2.3E-06	5.6E-05	1.2E-03
Diet 4	2.3E-05	5.7E-04	1.4E-02

Relative Risk [ ]			
Diet 1	1.0074	1.16	4.6
Diet 2	1.003	1.066	2.5
Diet 3	1.0019	1.036	1.91
Diet 4	1.023	1.43	9.9

Probability of Causation [%]			
Diet 1	0.73	14.0	78
Diet 2	0.30	6.2	60
Diet 3	0.19	3.5	48
Diet 4	2.20	30.0	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.52	2.9	15
Commercial Milk (locally produced)	0.16	0.96	7.2
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	1.2	9.2	61
Beef (locally produced)	0.00082	0.015	0.3
Leafy Vegetables (locally produced)	0.00031	0.0032	0.025
Eggs (locally produced)	0.029	0.2	1.4
Cottage Cheese (locally produced)	0.00072	0.0075	0.079
Inhalation	0.017	0.062	0.24
Mother's milk (mother on Diet 1)	0.000092	0.0032	0.088
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.6	3.3	17
Diet 2	0.25	1.3	8.9
Diet 3	0.22	1.2	8.1

Excess Lifetime Risk [ ]			
Diet 1	4.1E-05	5.6E-04	7.5E-03
Diet 2	1.9E-05	2.1E-04	3.1E-03
Diet 3	1.7E-05	2.0E-04	2.6E-03
Diet 4	1.0E-04	1.5E-03	1.9E-02

Relative Risk [ ]			
Diet 1	1.015	1.14	2.6
Diet 2	1.0059	1.056	1.75
Diet 3	1.0057	1.055	1.65
Diet 4	1.036	1.35	6.1

Probability of Causation [%]			
Diet 1	1.51	12.1	61
Diet 2	0.59	5.3	43
Diet 3	0.57	5.2	39
Diet 4	3.44	26.0	83

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.55	2.8	16
Commercial Milk (locally produced)	0.16	0.97	7.1
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	1.2	9	58
Beef (locally produced)	0.00088	0.015	0.3
Leafy Vegetables (locally produced)	0.00032	0.0031	0.027
Eggs (locally produced)	0.035	0.23	1.6
Cottage Cheese (locally produced)	0.00066	0.0077	0.083
Inhalation	0.017	0.061	0.24
Mother's milk (mother on Diet 1)	0.000092	0.0032	0.088
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.63	3.2	18
Diet 2	0.26	1.3	8.9
Diet 3	0.22	1.3	7.3

Excess Lifetime Risk [ ]			
Diet 1	3.9E-06	1.5E-04	2.6E-03
Diet 2	2.0E-06	5.7E-05	1.2E-03
Diet 3	2.2E-06	5.3E-05	1.2E-03
Diet 4	1.1E-05	3.6E-04	8.2E-03

Relative Risk [ ]			
Diet 1	1.0044	1.097	3
Diet 2	1.0019	1.038	1.91
Diet 3	1.0017	1.035	1.89
Diet 4	1.015	1.26	6.3

Probability of Causation [%]			
Diet 1	0.44	8.9	66
Diet 2	0.19	3.6	48
Diet 3	0.17	3.4	47
Diet 4	1.48	20.6	84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.2	7.2	39
Commercial Milk (locally produced)	0.35	2.4	16
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	3.1	22	150
Beef (locally produced)	0.0019	0.035	0.73
Leafy Vegetables (locally produced)	0.00073	0.0074	0.065
Eggs (locally produced)	0.067	0.47	3.3
Cottage Cheese (locally produced)	0.0018	0.018	0.21
Inhalation	0.042	0.16	0.59
Mother's milk (mother on Diet 1)	0.00021	0.0078	0.22
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.4	8.1	43
Diet 2	0.58	3.2	19
Diet 3	0.26	1.3	8.5

Excess Lifetime Risk [ ]			
Diet 1	8.4E-05	1.3E-03	1.9E-02
Diet 2	4.4E-05	5.2E-04	7.2E-03
Diet 3	1.9E-05	2.1E-04	2.6E-03
Diet 4	2.4E-04	3.7E-03	4.8E-02

Relative Risk [ ]			
Diet 1	1.038	1.35	4.2
Diet 2	1.014	1.14	2.5
Diet 3	1.0063	1.059	1.67
Diet 4	1.09	1.84	13

Probability of Causation [%]			
Diet 1	3.67	25.8	76
Diet 2	1.42	12.1	60
Diet 3	0.62	5.5	40
Diet 4	8.27	45.5	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.3	7	40
Commercial Milk (locally produced)	0.39	2.4	15
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	2.8	21	140
Beef (locally produced)	0.002	0.037	0.81
Leafy Vegetables (locally produced)	0.0007	0.0072	0.065
Eggs (locally produced)	0.074	0.55	3.9
Cottage Cheese (locally produced)	0.0016	0.018	0.22
Inhalation	0.042	0.16	0.58
Mother's milk (mother on Diet 1)	0.00021	0.0078	0.22
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.5	7.8	45
Diet 2	0.59	3.2	19
Diet 3	0.25	1.4	7.7

Excess Lifetime Risk [ ]			
Diet 1	1.1E-05	3.6E-04	6.9E-03
Diet 2	5.2E-06	1.5E-04	3.1E-03
Diet 3	2.4E-06	5.9E-05	1.2E-03
Diet 4	3.1E-05	8.4E-04	1.8E-02

Relative Risk [ ]			
Diet 1	1.011	1.24	6.3
Diet 2	1.0045	1.093	3.1
Diet 3	1.002	1.037	1.93
Diet 4	1.03	1.58	15

Probability of Causation [%]			
Diet 1	1.07	19.3	84
Diet 2	0.45	8.5	68
Diet 3	0.20	3.6	48
Diet 4	2.93	36.6	93

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.26	1.7	10
Commercial Milk (locally produced)	0.082	0.56	4
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	0.63	5.1	37
Beef (locally produced)	0.00048	0.0082	0.17
Leafy Vegetables (locally produced)	0.00016	0.0018	0.015
Eggs (locally produced)	0.014	0.12	0.84
Cottage Cheese (locally produced)	0.00039	0.0042	0.051
Inhalation	0.0095	0.036	0.14
Mother's milk (mother on Diet 1)	0.000046	0.0018	0.05
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.3	1.9	11
Diet 2	0.13	0.76	4.9
Diet 3	0.21	1.2	8.1

Excess Lifetime Risk [ ]			
Diet 1	2.0E-05	3.2E-04	4.3E-03
Diet 2	9.9E-06	1.2E-04	1.7E-03
Diet 3	1.7E-05	1.9E-04	2.6E-03
Diet 4	5.2E-05	8.7E-04	1.1E-02

Relative Risk [ ]			
Diet 1	1.0081	1.081	1.85
Diet 2	1.003	1.032	1.4
Diet 3	1.0055	1.053	1.64
Diet 4	1.019	1.2	3.9

Probability of Causation [%]			
Diet 1	0.80	7.5	45
Diet 2	0.30	3.1	28
Diet 3	0.55	5.1	39
Diet 4	1.84	16.6	74

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	1.6	10
Commercial Milk (locally produced)	0.081	0.56	4.1
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	0.64	5.1	35
Beef (locally produced)	0.0005	0.0084	0.18
Leafy Vegetables (locally produced)	0.00015	0.0018	0.016
Eggs (locally produced)	0.017	0.13	0.95
Cottage Cheese (locally produced)	0.00037	0.0043	0.052
Inhalation	0.0092	0.037	0.14
Mother's milk (mother on Diet 1)	0.000046	0.0018	0.05
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.31	1.8	11
Diet 2	0.13	0.79	5.1
Diet 3	0.21	1.2	7.2

Excess Lifetime Risk [ ]			
Diet 1	2.2E-06	8.5E-05	1.8E-03
Diet 2	1.1E-06	3.4E-05	7.5E-04
Diet 3	2.2E-06	5.1E-05	1.1E-03
Diet 4	6.8E-06	2.0E-04	4.7E-03

Relative Risk [ ]			
Diet 1	1.0025	1.055	2.2
Diet 2	1.0011	1.021	1.52
Diet 3	1.0017	1.034	1.87
Diet 4	1.0073	1.15	4.1

Probability of Causation [%]			
Diet 1	0.25	5.2	53
Diet 2	0.11	2.1	34
Diet 3	0.17	3.3	47
Diet 4	0.72	12.5	74

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6	33
Commercial Milk (locally produced)	0.31	2	13
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	2.7	18	130
Beef (locally produced)	0.0016	0.029	0.59
Leafy Vegetables (locally produced)	0.00059	0.0062	0.055
Eggs (locally produced)	0.054	0.4	2.7
Cottage Cheese (locally produced)	0.0015	0.015	0.17
Inhalation	0.035	0.13	0.49
Mother's milk (mother on Diet 1)	0.00019	0.0064	0.18
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.2	6.7	36
Diet 2	0.49	2.6	16
Diet 3	0.25	1.3	8.4

Excess Lifetime Risk [ ]			
Diet 1	7.2E-05	1.1E-03	1.5E-02
Diet 2	3.8E-05	4.3E-04	6.0E-03
Diet 3	1.8E-05	2.1E-04	2.6E-03
Diet 4	2.0E-04	3.2E-03	4.0E-02

Relative Risk [ ]			
Diet 1	1.031	1.29	3.7
Diet 2	1.012	1.11	2.3
Diet 3	1.0061	1.058	1.66
Diet 4	1.078	1.69	10.8

Probability of Causation [%]			
Diet 1	2.99	22.3	73
Diet 2	1.18	10.3	56
Diet 3	0.61	5.4	40
Diet 4	7.25	40.8	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	5.9	34
Commercial Milk (locally produced)	0.32	2	13
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	2.4	18	120
Beef (locally produced)	0.0017	0.031	0.65
Leafy Vegetables (locally produced)	0.00058	0.0061	0.054
Eggs (locally produced)	0.063	0.46	3.2
Cottage Cheese (locally produced)	0.0014	0.015	0.18
Inhalation	0.035	0.13	0.47
Mother's milk (mother on Diet 1)	0.00019	0.0064	0.18
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	1.3	6.5	38
Diet 2	0.5	2.8	16
Diet 3	0.24	1.3	7.6

Excess Lifetime Risk [ ]			
Diet 1	9.1E-06	3.0E-04	5.7E-03
Diet 2	4.4E-06	1.2E-04	2.5E-03
Diet 3	2.3E-06	5.7E-05	1.2E-03
Diet 4	2.6E-05	6.9E-04	1.5E-02

Relative Risk [ ]			
Diet 1	1.0087	1.2	5.3
Diet 2	1.0037	1.077	2.7
Diet 3	1.0019	1.036	1.91
Diet 4	1.026	1.5	13

Probability of Causation [%]			
Diet 1	0.87	16.5	81
Diet 2	0.37	7.2	63
Diet 3	0.19	3.5	48
Diet 4	2.50	33.1	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.48	2.8	15
Commercial Milk (locally produced)	0.15	0.94	6.4
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	1.1	8.9	58
Beef (locally produced)	0.00076	0.014	0.27
Leafy Vegetables (locally produced)	0.0003	0.003	0.025
Eggs (locally produced)	0.029	0.2	1.4
Cottage Cheese (locally produced)	0.0007	0.0073	0.08
Inhalation	0.016	0.062	0.24
Mother's milk (mother on Diet 1)	0.000091	0.0031	0.088
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.56	3.2	17
Diet 2	0.23	1.3	7.7
Diet 3	0.22	1.2	8.2

Excess Lifetime Risk [ ]			
Diet 1	3.6E-05	5.2E-04	7.3E-03
Diet 2	1.8E-05	2.0E-04	3.0E-03
Diet 3	1.7E-05	2.0E-04	2.6E-03
Diet 4	9.8E-05	1.5E-03	1.9E-02

Relative Risk [ ]			
Diet 1	1.015	1.13	2.4
Diet 2	1.0056	1.055	1.71
Diet 3	1.0057	1.055	1.65
Diet 4	1.036	1.34	6.2

Probability of Causation [%]			
Diet 1	1.49	11.8	59
Diet 2	0.56	5.2	41
Diet 3	0.57	5.2	39
Diet 4	3.51	25.1	83

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.5	2.8	15
Commercial Milk (locally produced)	0.15	0.96	6.3
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	1.1	8.7	60
Beef (locally produced)	0.00083	0.014	0.28
Leafy Vegetables (locally produced)	0.00028	0.0029	0.026
Eggs (locally produced)	0.033	0.23	1.5
Cottage Cheese (locally produced)	0.00064	0.0075	0.079
Inhalation	0.016	0.062	0.24
Mother's milk (mother on Diet 1)	0.000091	0.0031	0.088
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.57	3.1	18
Diet 2	0.24	1.3	7.8
Diet 3	0.22	1.3	7.3

Excess Lifetime Risk [ ]			
Diet 1	4.5E-06	1.4E-04	2.6E-03
Diet 2	1.9E-06	5.6E-05	1.2E-03
Diet 3	2.2E-06	5.3E-05	1.2E-03
Diet 4	1.2E-05	3.4E-04	7.6E-03

Relative Risk [ ]			
Diet 1	1.004	1.093	2.9
Diet 2	1.0018	1.037	1.83
Diet 3	1.0017	1.035	1.89
Diet 4	1.013	1.25	5.9

Probability of Causation [%]			
Diet 1	0.40	8.5	65
Diet 2	0.18	3.5	45
Diet 3	0.17	3.4	47
Diet 4	1.29	19.8	82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.78	4.7	25
Commercial Milk (locally produced)	0.23	1.5	10
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	1.9	14	94
Beef (locally produced)	0.0012	0.022	0.45
Leafy Vegetables (locally produced)	0.00047	0.0049	0.042
Eggs (locally produced)	0.045	0.31	2.1
Cottage Cheese (locally produced)	0.0012	0.012	0.14
Inhalation	0.028	0.1	0.38
Mother's milk (mother on Diet 1)	0.00013	0.005	0.14
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.91	5.2	28
Diet 2	0.37	2.1	12
Diet 3	0.24	1.3	8.3

Excess Lifetime Risk [ ]			
Diet 1	5.3E-05	8.6E-04	1.2E-02
Diet 2	2.8E-05	3.3E-04	4.4E-03
Diet 3	1.8E-05	2.0E-04	2.6E-03
Diet 4	1.4E-04	2.4E-03	2.9E-02

Relative Risk [ ]			
Diet 1	1.023	1.23	3.1
Diet 2	1.0088	1.089	1.99
Diet 3	1.0059	1.057	1.66
Diet 4	1.056	1.54	9

Probability of Causation [%]			
Diet 1	2.27	18.3	67
Diet 2	0.87	8.2	49
Diet 3	0.59	5.4	40
Diet 4	5.27	34.6	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.83	4.6	26
Commercial Milk (locally produced)	0.24	1.5	10
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	1.9	14	93
Beef (locally produced)	0.0013	0.023	0.49
Leafy Vegetables (locally produced)	0.00047	0.0046	0.041
Eggs (locally produced)	0.049	0.36	2.5
Cottage Cheese (locally produced)	0.0011	0.012	0.13
Inhalation	0.028	0.1	0.37
Mother's milk (mother on Diet 1)	0.00013	0.005	0.14
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.96	5.1	29
Diet 2	0.37	2.1	12
Diet 3	0.23	1.3	7.5

Excess Lifetime Risk [ ]			
Diet 1	7.2E-06	2.4E-04	4.3E-03
Diet 2	3.2E-06	9.3E-05	2.0E-03
Diet 3	2.3E-06	5.5E-05	1.2E-03
Diet 4	1.9E-05	5.5E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.007	1.15	4.2
Diet 2	1.0029	1.058	2.3
Diet 3	1.0018	1.036	1.91
Diet 4	1.021	1.39	9.3

Probability of Causation [%]			
Diet 1	0.69	13.2	75
Diet 2	0.29	5.5	56
Diet 3	0.18	3.4	48
Diet 4	2.02	27.6	89

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.42	2.6	14
Commercial Milk (locally produced)	0.13	0.88	5.3
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	1.1	8.2	61
Beef (locally produced)	0.00073	0.013	0.29
Leafy Vegetables (locally produced)	0.00025	0.0027	0.024
Eggs (locally produced)	0.023	0.17	1.4
Cottage Cheese (locally produced)	0.00059	0.0065	0.076
Inhalation	0.017	0.07	0.29
Mother's milk (mother on Diet 1)	0.000095	0.0028	0.087
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.49	2.9	16
Diet 2	0.21	1.2	6.7
Diet 3	0.22	1.2	8.2

Excess Lifetime Risk [ ]			
Diet 1	3.5E-05	4.8E-04	6.9E-03
Diet 2	1.4E-05	2.0E-04	2.5E-03
Diet 3	1.7E-05	2.0E-04	2.6E-03
Diet 4	9.2E-05	1.4E-03	1.8E-02

Relative Risk [ ]			
Diet 1	1.014	1.12	2.4
Diet 2	1.0053	1.051	1.58
Diet 3	1.0057	1.055	1.65
Diet 4	1.035	1.31	5.8

Probability of Causation [%]			
Diet 1	1.35	10.9	59
Diet 2	0.53	4.8	37
Diet 3	0.57	5.2	39
Diet 4	3.34	23.9	83

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.44	2.5	16
Commercial Milk (locally produced)	0.13	0.89	5.4
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	1	7.8	60
Beef (locally produced)	0.0008	0.013	0.32
Leafy Vegetables (locally produced)	0.00024	0.0027	0.025
Eggs (locally produced)	0.027	0.2	1.4
Cottage Cheese (locally produced)	0.00057	0.0066	0.075
Inhalation	0.016	0.069	0.25
Mother's milk (mother on Diet 1)	0.000095	0.0028	0.087
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.51	2.9	17
Diet 2	0.2	1.2	6.9
Diet 3	0.22	1.3	7.4

Excess Lifetime Risk [ ]			
Diet 1	4.0E-06	1.3E-04	2.6E-03
Diet 2	1.8E-06	5.1E-05	1.1E-03
Diet 3	2.2E-06	5.4E-05	1.2E-03
Diet 4	1.1E-05	3.0E-04	7.3E-03

Relative Risk [ ]			
Diet 1	1.004	1.085	2.9
Diet 2	1.0017	1.034	1.71
Diet 3	1.0018	1.035	1.89
Diet 4	1.012	1.23	5.8

Probability of Causation [%]			
Diet 1	0.40	7.8	65
Diet 2	0.17	3.3	42
Diet 3	0.18	3.4	47
Diet 4	1.17	18.5	82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.09	0.71	4.1
Commercial Milk (locally produced)	0.033	0.24	1.8
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	0.29	2.4	17
Beef (locally produced)	0.00021	0.0034	0.084
Leafy Vegetables (locally produced)	0.000068	0.00074	0.007
Eggs (locally produced)	0.0058	0.048	0.36
Cottage Cheese (locally produced)	0.00016	0.0018	0.02
Inhalation	0.004	0.016	0.073
Mother's milk (mother on Diet 1)	0.00002	0.00076	0.024
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.11	0.78	4.6
Diet 2	0.051	0.32	2.3
Diet 3	0.2	1.2	8

Excess Lifetime Risk [ ]			
Diet 1	8.0E-06	1.4E-04	1.9E-03
Diet 2	4.0E-06	5.1E-05	7.9E-04
Diet 3	1.6E-05	1.9E-04	2.6E-03
Diet 4	2.1E-05	3.4E-04	5.2E-03

Relative Risk [ ]			
Diet 1	1.0034	1.034	1.49
Diet 2	1.0015	1.014	1.23
Diet 3	1.0054	1.052	1.64
Diet 4	1.0081	1.089	2.3

Probability of Causation [%]			
Diet 1	0.34	3.3	33
Diet 2	0.15	1.4	18
Diet 3	0.54	4.9	39
Diet 4	0.81	8.2	56

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**  
**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.097	0.69	4.5
Commercial Milk (locally produced)	0.034	0.24	1.9
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	0.28	2.2	16
Beef (locally produced)	0.00022	0.0036	0.086
Leafy Vegetables (locally produced)	0.000068	0.00074	0.0074
Eggs (locally produced)	0.0066	0.055	0.38
Cottage Cheese (locally produced)	0.00014	0.0019	0.02
Inhalation	0.0039	0.016	0.068
Mother's milk (mother on Diet 1)	0.00002	0.00076	0.024
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.11	0.78	4.9
Diet 2	0.052	0.33	2.4
Diet 3	0.2	1.2	7.2

Excess Lifetime Risk [ ]			
Diet 1	1.0E-06	3.5E-05	7.2E-04
Diet 2	4.8E-07	1.5E-05	3.2E-04
Diet 3	2.1E-06	5.1E-05	1.1E-03
Diet 4	3.1E-06	8.8E-05	2.1E-03

Relative Risk [ ]			
Diet 1	1.00093	1.024	1.55
Diet 2	1.00044	1.0097	1.24
Diet 3	1.0016	1.034	1.86
Diet 4	1.0024	1.062	2.6

Probability of Causation [%]			
Diet 1	0.09	2.3	35
Diet 2	0.04	1.0	19
Diet 3	0.16	3.3	46
Diet 4	0.24	5.8	62

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.5	3	17
Commercial Milk (locally produced)	0.16	1	6.9
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	1.3	9.4	67
Beef (locally produced)	0.00086	0.014	0.31
Leafy Vegetables (locally produced)	0.0003	0.0031	0.029
Eggs (locally produced)	0.028	0.2	1.4
Cottage Cheese (locally produced)	0.0007	0.0076	0.088
Inhalation	0.019	0.071	0.27
Mother's milk (mother on Diet 1)	0.000097	0.0032	0.089
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.59	3.3	19
Diet 2	0.25	1.4	8.5
Diet 3	0.23	1.2	8.2

Excess Lifetime Risk [ ]			
Diet 1	3.6E-05	5.7E-04	7.5E-03
Diet 2	1.8E-05	2.2E-04	3.0E-03
Diet 3	1.7E-05	2.0E-04	2.6E-03
Diet 4	1.0E-04	1.6E-03	1.8E-02

Relative Risk [ ]			
Diet 1	1.015	1.14	2.4
Diet 2	1.0061	1.058	1.66
Diet 3	1.0058	1.055	1.65
Diet 4	1.037	1.36	5.9

Probability of Causation [%]			
Diet 1	1.52	12.2	58
Diet 2	0.61	5.4	39
Diet 3	0.58	5.2	39
Diet 4	3.59	25.7	82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.52	3	18
Commercial Milk (locally produced)	0.16	0.99	6.7
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	1.2	9	62
Beef (locally produced)	0.00092	0.015	0.34
Leafy Vegetables (locally produced)	0.00028	0.003	0.029
Eggs (locally produced)	0.031	0.23	1.6
Cottage Cheese (locally produced)	0.00064	0.0078	0.089
Inhalation	0.018	0.071	0.27
Mother's milk (mother on Diet 1)	0.000097	0.0032	0.089
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.62	3.3	20
Diet 2	0.25	1.4	8.7
Diet 3	0.22	1.3	7.4

Excess Lifetime Risk [ ]			
Diet 1	4.9E-06	1.5E-04	2.8E-03
Diet 2	2.3E-06	5.9E-05	1.2E-03
Diet 3	2.2E-06	5.4E-05	1.2E-03
Diet 4	1.4E-05	3.3E-04	8.0E-03

Relative Risk [ ]			
Diet 1	1.0044	1.096	3.1
Diet 2	1.0018	1.04	1.92
Diet 3	1.0018	1.035	1.89
Diet 4	1.013	1.25	6.6

Probability of Causation [%]			
Diet 1	0.44	8.7	67
Diet 2	0.18	3.8	47
Diet 3	0.18	3.4	47
Diet 4	1.30	19.8	84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.42	2.7	15
Commercial Milk (locally produced)	0.14	0.92	6.1
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	1.1	8.6	64
Beef (locally produced)	0.00077	0.013	0.27
Leafy Vegetables (locally produced)	0.00029	0.0029	0.026
Eggs (locally produced)	0.026	0.19	1.3
Cottage Cheese (locally produced)	0.00068	0.0071	0.075
Inhalation	0.019	0.07	0.29
Mother's milk (mother on Diet 1)	0.000091	0.003	0.087
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.5	3	16
Diet 2	0.23	1.3	7.8
Diet 3	0.22	1.2	8.2

Excess Lifetime Risk [ ]			
Diet 1	3.5E-05	5.1E-04	7.0E-03
Diet 2	1.8E-05	2.0E-04	2.9E-03
Diet 3	1.7E-05	2.0E-04	2.6E-03
Diet 4	9.3E-05	1.4E-03	1.9E-02

Relative Risk [ ]			
Diet 1	1.014	1.13	2.5
Diet 2	1.0057	1.053	1.68
Diet 3	1.0058	1.055	1.65
Diet 4	1.036	1.34	5.8

Probability of Causation [%]			
Diet 1	1.43	11.4	59
Diet 2	0.57	5.0	40
Diet 3	0.57	5.2	39
Diet 4	3.47	25.0	83

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.44	2.7	15
Commercial Milk (locally produced)	0.14	0.93	6.1
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	1.1	8.4	61
Beef (locally produced)	0.00085	0.014	0.28
Leafy Vegetables (locally produced)	0.00026	0.0028	0.025
Eggs (locally produced)	0.03	0.21	1.4
Cottage Cheese (locally produced)	0.00062	0.0072	0.075
Inhalation	0.018	0.071	0.28
Mother's milk (mother on Diet 1)	0.000091	0.003	0.087
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.53	3	17
Diet 2	0.23	1.3	7.9
Diet 3	0.22	1.3	7.4

Excess Lifetime Risk [ ]			
Diet 1	4.4E-06	1.4E-04	2.5E-03
Diet 2	1.9E-06	5.5E-05	1.2E-03
Diet 3	2.2E-06	5.4E-05	1.2E-03
Diet 4	1.1E-05	3.2E-04	7.9E-03

Relative Risk [ ]			
Diet 1	1.0036	1.09	2.9
Diet 2	1.0017	1.036	1.82
Diet 3	1.0018	1.035	1.9
Diet 4	1.011	1.24	6

Probability of Causation [%]			
Diet 1	0.36	8.2	65
Diet 2	0.17	3.5	45
Diet 3	0.18	3.4	47
Diet 4	1.11	19.6	82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.5	3.1	17
Commercial Milk (locally produced)	0.16	1	6.8
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	1.3	9.8	72
Beef (locally produced)	0.00092	0.015	0.31
Leafy Vegetables (locally produced)	0.0003	0.0032	0.03
Eggs (locally produced)	0.028	0.21	1.5
Cottage Cheese (locally produced)	0.00069	0.0081	0.089
Inhalation	0.022	0.082	0.34
Mother's milk (mother on Diet 1)	0.00011	0.0034	0.095
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.59	3.5	19
Diet 2	0.25	1.4	8.6
Diet 3	0.23	1.3	8.2

Excess Lifetime Risk [ ]			
Diet 1	3.7E-05	6.1E-04	8.3E-03
Diet 2	2.0E-05	2.4E-04	3.2E-03
Diet 3	1.7E-05	2.0E-04	2.6E-03
Diet 4	9.8E-05	1.7E-03	2.1E-02

Relative Risk [ ]			
Diet 1	1.016	1.15	2.5
Diet 2	1.0067	1.059	1.66
Diet 3	1.0058	1.055	1.66
Diet 4	1.041	1.37	6.2

Probability of Causation [%]			
Diet 1	1.55	12.7	61
Diet 2	0.67	5.6	40
Diet 3	0.58	5.3	40
Diet 4	3.92	27.0	84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.54	3	18
Commercial Milk (locally produced)	0.15	1	6.9
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	1.3	9.4	63
Beef (locally produced)	0.00096	0.016	0.33
Leafy Vegetables (locally produced)	0.00029	0.0032	0.029
Eggs (locally produced)	0.033	0.24	1.7
Cottage Cheese (locally produced)	0.00067	0.0079	0.089
Inhalation	0.021	0.083	0.32
Mother's milk (mother on Diet 1)	0.00011	0.0034	0.095
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.65	3.4	20
Diet 2	0.25	1.5	9
Diet 3	0.22	1.3	7.4

Excess Lifetime Risk [ ]			
Diet 1	5.1E-06	1.5E-04	3.1E-03
Diet 2	2.3E-06	6.3E-05	1.3E-03
Diet 3	2.2E-06	5.5E-05	1.2E-03
Diet 4	1.4E-05	3.7E-04	8.5E-03

Relative Risk [ ]			
Diet 1	1.0046	1.1	3.3
Diet 2	1.0019	1.042	1.92
Diet 3	1.0018	1.035	1.9
Diet 4	1.013	1.26	7.3

Probability of Causation [%]			
Diet 1	0.45	9.4	69
Diet 2	0.19	4.0	48
Diet 3	0.18	3.4	47
Diet 4	1.31	20.9	86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.27	1.7	11
Commercial Milk (locally produced)	0.086	0.58	4.2
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	0.68	5.2	42
Beef (locally produced)	0.00051	0.0084	0.18
Leafy Vegetables (locally produced)	0.00016	0.0018	0.018
Eggs (locally produced)	0.016	0.12	0.92
Cottage Cheese (locally produced)	0.0004	0.0043	0.055
Inhalation	0.012	0.047	0.19
Mother's milk (mother on Diet 1)	0.000056	0.0019	0.053
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.33	1.9	12
Diet 2	0.15	0.79	5.3
Diet 3	0.22	1.2	8.1

Excess Lifetime Risk [ ]			
Diet 1	2.3E-05	3.3E-04	4.8E-03
Diet 2	1.1E-05	1.3E-04	1.8E-03
Diet 3	1.7E-05	1.9E-04	2.6E-03
Diet 4	5.9E-05	8.7E-04	1.1E-02

Relative Risk [ ]			
Diet 1	1.0085	1.08	1.93
Diet 2	1.0038	1.033	1.38
Diet 3	1.0057	1.053	1.65
Diet 4	1.021	1.2	4.2

Probability of Causation [%]			
Diet 1	0.84	7.4	48
Diet 2	0.38	3.2	27
Diet 3	0.57	5.1	39
Diet 4	2.06	16.9	76

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.29	1.7	11
Commercial Milk (locally produced)	0.085	0.57	3.9
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	0.64	5.2	40
Beef (locally produced)	0.00052	0.009	0.18
Leafy Vegetables (locally produced)	0.00016	0.0017	0.017
Eggs (locally produced)	0.019	0.13	0.92
Cottage Cheese (locally produced)	0.00034	0.0045	0.053
Inhalation	0.013	0.048	0.2
Mother's milk (mother on Diet 1)	0.000056	0.0019	0.053
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.35	1.9	12
Diet 2	0.15	0.8	5.3
Diet 3	0.22	1.3	7.3

Excess Lifetime Risk [ ]			
Diet 1	2.7E-06	7.8E-05	1.7E-03
Diet 2	1.3E-06	3.4E-05	7.5E-04
Diet 3	2.2E-06	5.3E-05	1.1E-03
Diet 4	7.5E-06	1.9E-04	4.7E-03

Relative Risk [ ]			
Diet 1	1.0024	1.057	2.3
Diet 2	1.00098	1.023	1.54
Diet 3	1.0017	1.035	1.87
Diet 4	1.0066	1.15	3.8

Probability of Causation [%]			
Diet 1	0.24	5.4	55
Diet 2	0.10	2.3	35
Diet 3	0.17	3.3	47
Diet 4	0.65	13.0	74

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.48	2.7	16
Commercial Milk (locally produced)	0.14	0.9	5.9
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	1.2	8.3	57
Beef (locally produced)	0.00077	0.013	0.26
Leafy Vegetables (locally produced)	0.00026	0.0028	0.025
Eggs (locally produced)	0.025	0.19	1.3
Cottage Cheese (locally produced)	0.00062	0.0067	0.078
Inhalation	0.019	0.07	0.27
Mother's milk (mother on Diet 1)	0.00009	0.003	0.081
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.55	3.1	17
Diet 2	0.24	1.2	7.4
Diet 3	0.23	1.2	8.2

Excess Lifetime Risk [ ]			
Diet 1	3.4E-05	5.2E-04	6.6E-03
Diet 2	1.8E-05	2.0E-04	2.8E-03
Diet 3	1.8E-05	2.0E-04	2.6E-03
Diet 4	8.9E-05	1.4E-03	1.7E-02

Relative Risk [ ]			
Diet 1	1.013	1.13	2.3
Diet 2	1.0054	1.053	1.58
Diet 3	1.0058	1.055	1.65
Diet 4	1.035	1.32	5.7

Probability of Causation [%]			
Diet 1	1.32	11.2	56
Diet 2	0.54	5.0	36
Diet 3	0.58	5.2	39
Diet 4	3.40	24.1	82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**  
**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.51	2.7	15
Commercial Milk (locally produced)	0.14	0.91	5.9
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	1.1	8.2	56
Beef (locally produced)	0.00078	0.014	0.27
Leafy Vegetables (locally produced)	0.00026	0.0027	0.025
Eggs (locally produced)	0.03	0.21	1.4
Cottage Cheese (locally produced)	0.00059	0.0071	0.077
Inhalation	0.02	0.071	0.27
Mother's milk (mother on Diet 1)	0.00009	0.003	0.081
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.6	3	18
Diet 2	0.24	1.3	7.8
Diet 3	0.23	1.3	7.4

Excess Lifetime Risk [ ]			
Diet 1	4.3E-06	1.3E-04	2.6E-03
Diet 2	2.0E-06	5.2E-05	1.2E-03
Diet 3	2.2E-06	5.4E-05	1.2E-03
Diet 4	1.2E-05	3.0E-04	7.0E-03

Relative Risk [ ]			
Diet 1	1.0039	1.09	2.8
Diet 2	1.0017	1.035	1.81
Diet 3	1.0018	1.035	1.89
Diet 4	1.011	1.24	5.8

Probability of Causation [%]			
Diet 1	0.39	8.3	64
Diet 2	0.17	3.4	45
Diet 3	0.18	3.4	47
Diet 4	1.12	19.2	82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.26	1.6	8.3
Commercial Milk (locally produced)	0.084	0.55	3.6
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	0.78	5.2	36
Beef (locally produced)	0.00045	0.0081	0.17
Leafy Vegetables (locally produced)	0.00017	0.0017	0.015
Eggs (locally produced)	0.014	0.11	0.71
Cottage Cheese (locally produced)	0.00045	0.0041	0.045
Inhalation	0.01	0.038	0.15
Mother's milk (mother on Diet 1)	0.000055	0.0018	0.056
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.31	1.8	9.1
Diet 2	0.14	0.74	4.8
Diet 3	0.21	1.2	8.1

Excess Lifetime Risk [ ]			
Diet 1	2.1E-05	3.1E-04	4.2E-03
Diet 2	1.1E-05	1.2E-04	1.7E-03
Diet 3	1.7E-05	1.9E-04	2.6E-03
Diet 4	5.5E-05	8.3E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.0087	1.078	1.84
Diet 2	1.0035	1.032	1.43
Diet 3	1.0055	1.053	1.64
Diet 4	1.022	1.2	3.7

Probability of Causation [%]			
Diet 1	0.86	7.3	45
Diet 2	0.35	3.1	30
Diet 3	0.55	5.0	39
Diet 4	2.12	16.5	73

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**  
**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.27	1.6	8.6
Commercial Milk (locally produced)	0.087	0.56	3.6
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	0.68	5.1	33
Beef (locally produced)	0.00049	0.0086	0.2
Leafy Vegetables (locally produced)	0.00016	0.0017	0.015
Eggs (locally produced)	0.017	0.13	0.84
Cottage Cheese (locally produced)	0.00041	0.0044	0.046
Inhalation	0.011	0.039	0.15
Mother's milk (mother on Diet 1)	0.000055	0.0018	0.056
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.33	1.8	9.7
Diet 2	0.14	0.77	4.7
Diet 3	0.21	1.2	7.2

Excess Lifetime Risk [ ]			
Diet 1	2.5E-06	8.3E-05	1.6E-03
Diet 2	1.2E-06	3.4E-05	7.2E-04
Diet 3	2.2E-06	5.2E-05	1.1E-03
Diet 4	7.9E-06	2.0E-04	4.7E-03

Relative Risk [ ]			
Diet 1	1.0023	1.054	2.2
Diet 2	1.001	1.022	1.49
Diet 3	1.0017	1.034	1.87
Diet 4	1.0066	1.14	4.2

Probability of Causation [%]			
Diet 1	0.23	5.1	53
Diet 2	0.10	2.1	33
Diet 3	0.17	3.3	47
Diet 4	0.66	12.4	76

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.3	2	11
Commercial Milk (locally produced)	0.1	0.7	4.4
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	0.7	6.1	48
Beef (locally produced)	0.00055	0.0097	0.19
Leafy Vegetables (locally produced)	0.00022	0.0021	0.019
Eggs (locally produced)	0.02	0.13	1.1
Cottage Cheese (locally produced)	0.00049	0.0052	0.055
Inhalation	0.014	0.056	0.22
Mother's milk (mother on Diet 1)	0.00007	0.0022	0.063
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.36	2.2	12
Diet 2	0.17	0.95	5.3
Diet 3	0.22	1.2	8.2

Excess Lifetime Risk [ ]			
Diet 1	2.5E-05	3.6E-04	5.2E-03
Diet 2	1.3E-05	1.5E-04	2.2E-03
Diet 3	1.7E-05	1.9E-04	2.6E-03
Diet 4	7.4E-05	1.1E-03	1.5E-02

Relative Risk [ ]			
Diet 1	1.011	1.093	2
Diet 2	1.0042	1.04	1.49
Diet 3	1.0057	1.054	1.65
Diet 4	1.026	1.25	4.7

Probability of Causation [%]			
Diet 1	1.11	8.5	51
Diet 2	0.42	3.9	33
Diet 3	0.57	5.1	39
Diet 4	2.49	19.9	79

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.32	1.9	11
Commercial Milk (locally produced)	0.1	0.69	4.4
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	0.7	6	50
Beef (locally produced)	0.0006	0.01	0.2
Leafy Vegetables (locally produced)	0.00019	0.0021	0.018
Eggs (locally produced)	0.022	0.16	1
Cottage Cheese (locally produced)	0.00046	0.0053	0.054
Inhalation	0.014	0.057	0.22
Mother's milk (mother on Diet 1)	0.00007	0.0022	0.063
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.38	2.2	13
Diet 2	0.16	0.97	5.4
Diet 3	0.21	1.3	7.4

Excess Lifetime Risk [ ]			
Diet 1	3.5E-06	1.0E-04	1.9E-03
Diet 2	1.4E-06	3.9E-05	8.4E-04
Diet 3	2.2E-06	5.3E-05	1.2E-03
Diet 4	8.2E-06	2.3E-04	5.6E-03

Relative Risk [ ]			
Diet 1	1.0027	1.065	2.4
Diet 2	1.0012	1.027	1.56
Diet 3	1.0017	1.035	1.88
Diet 4	1.0084	1.19	4.3

Probability of Causation [%]			
Diet 1	0.27	6.1	57
Diet 2	0.12	2.6	36
Diet 3	0.17	3.4	47
Diet 4	0.83	15.8	77

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.57	3.4	18
Commercial Milk (locally produced)	0.18	1.2	7.9
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	1.5	10	71
Beef (locally produced)	0.00096	0.016	0.32
Leafy Vegetables (locally produced)	0.00036	0.0036	0.033
Eggs (locally produced)	0.031	0.23	1.6
Cottage Cheese (locally produced)	0.00084	0.0086	0.098
Inhalation	0.023	0.088	0.35
Mother's milk (mother on Diet 1)	0.00011	0.0037	0.1
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.66	3.9	20
Diet 2	0.28	1.6	9.6
Diet 3	0.23	1.3	8.2

Excess Lifetime Risk [ ]			
Diet 1	4.1E-05	6.4E-04	8.5E-03
Diet 2	2.0E-05	2.5E-04	3.5E-03
Diet 3	1.8E-05	2.0E-04	2.6E-03
Diet 4	1.1E-04	1.9E-03	2.2E-02

Relative Risk [ ]			
Diet 1	1.018	1.17	2.6
Diet 2	1.0074	1.065	1.73
Diet 3	1.0059	1.056	1.65
Diet 4	1.045	1.41	6.8

Probability of Causation [%]			
Diet 1	1.77	14.4	61
Diet 2	0.73	6.1	42
Diet 3	0.58	5.3	40
Diet 4	4.32	28.8	85

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.61	3.4	19
Commercial Milk (locally produced)	0.18	1.2	7.7
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	1.5	10	70
Beef (locally produced)	0.001	0.017	0.35
Leafy Vegetables (locally produced)	0.00035	0.0035	0.032
Eggs (locally produced)	0.037	0.27	1.9
Cottage Cheese (locally produced)	0.00081	0.0088	0.099
Inhalation	0.024	0.088	0.34
Mother's milk (mother on Diet 1)	0.00011	0.0037	0.1
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.71	3.8	21
Diet 2	0.29	1.6	9.8
Diet 3	0.23	1.3	7.4

Excess Lifetime Risk [ ]			
Diet 1	5.3E-06	1.7E-04	3.2E-03
Diet 2	2.6E-06	7.0E-05	1.5E-03
Diet 3	2.3E-06	5.5E-05	1.2E-03
Diet 4	1.5E-05	3.9E-04	8.8E-03

Relative Risk [ ]			
Diet 1	1.005	1.11	3.3
Diet 2	1.0022	1.045	2
Diet 3	1.0018	1.035	1.9
Diet 4	1.015	1.29	7

Probability of Causation [%]			
Diet 1	0.50	10.1	70
Diet 2	0.22	4.3	51
Diet 3	0.18	3.4	47
Diet 4	1.45	22.6	86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.27	1.7	8.9
Commercial Milk (locally produced)	0.077	0.54	3.6
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	0.67	5.1	38
Beef (locally produced)	0.0005	0.0081	0.17
Leafy Vegetables (locally produced)	0.00015	0.0018	0.015
Eggs (locally produced)	0.015	0.11	0.74
Cottage Cheese (locally produced)	0.00037	0.0043	0.05
Inhalation	0.012	0.046	0.21
Mother's milk (mother on Diet 1)	0.000057	0.002	0.051
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.33	1.9	9.7
Diet 2	0.13	0.76	4.5
Diet 3	0.21	1.2	8.1

Excess Lifetime Risk [ ]			
Diet 1	1.9E-05	3.3E-04	4.8E-03
Diet 2	1.0E-05	1.3E-04	1.7E-03
Diet 3	1.7E-05	1.9E-04	2.6E-03
Diet 4	5.2E-05	9.1E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.0081	1.078	1.83
Diet 2	1.0036	1.031	1.36
Diet 3	1.0056	1.054	1.65
Diet 4	1.02	1.2	3.7

Probability of Causation [%]			
Diet 1	0.81	7.2	45
Diet 2	0.36	3.0	26
Diet 3	0.56	5.1	39
Diet 4	1.98	16.6	73

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.29	1.6	9.6
Commercial Milk (locally produced)	0.076	0.55	3.6
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	0.65	5.1	34
Beef (locally produced)	0.00054	0.0084	0.18
Leafy Vegetables (locally produced)	0.00015	0.0017	0.015
Eggs (locally produced)	0.018	0.13	0.96
Cottage Cheese (locally produced)	0.00034	0.0042	0.046
Inhalation	0.012	0.048	0.2
Mother's milk (mother on Diet 1)	0.000057	0.002	0.051
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.36	1.8	11
Diet 2	0.14	0.81	4.4
Diet 3	0.21	1.2	7.3

Excess Lifetime Risk [ ]			
Diet 1	2.6E-06	8.0E-05	1.6E-03
Diet 2	1.3E-06	3.4E-05	6.6E-04
Diet 3	2.2E-06	5.3E-05	1.1E-03
Diet 4	7.6E-06	2.1E-04	4.3E-03

Relative Risk [ ]			
Diet 1	1.0027	1.057	2.2
Diet 2	1.001	1.023	1.47
Diet 3	1.0017	1.035	1.88
Diet 4	1.0077	1.14	4.3

Probability of Causation [%]			
Diet 1	0.27	5.4	54
Diet 2	0.10	2.2	32
Diet 3	0.17	3.3	47
Diet 4	0.77	12.1	77

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**  
**Receptor: Female born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.57	3.1	17
Commercial Milk (locally produced)	0.17	1	6.8
Commercial Milk (regionally mixed)	0.19	1.2	7.9
Goat Milk (locally produced)	1.5	9.7	65
Beef (locally produced)	0.00086	0.015	0.29
Leafy Vegetables (locally produced)	0.00031	0.0033	0.029
Eggs (locally produced)	0.029	0.21	1.5
Cottage Cheese (locally produced)	0.00074	0.0079	0.088
Inhalation	0.021	0.077	0.29
Mother's milk (mother on Diet 1)	0.00011	0.0034	0.096
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.65	3.5	19
Diet 2	0.27	1.4	8.6
Diet 3	0.23	1.2	8.2

	Excess Lifetime Risk [ ]		
Diet 1	4.0E-05	5.9E-04	7.5E-03
Diet 2	2.0E-05	2.3E-04	3.1E-03
Diet 3	1.8E-05	2.0E-04	2.6E-03
Diet 4	1.0E-04	1.7E-03	2.0E-02

	Relative Risk [ ]		
Diet 1	1.015	1.15	2.5
Diet 2	1.0064	1.061	1.68
Diet 3	1.0058	1.055	1.65
Diet 4	1.042	1.37	6.2

	Probability of Causation [%]		
Diet 1	1.49	12.9	59
Diet 2	0.63	5.7	41
Diet 3	0.58	5.2	39
Diet 4	4.08	26.8	84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**

**Receptor: Male born in 1944**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.59	3.1	18
Commercial Milk (locally produced)	0.17	1	6.6
Commercial Milk (regionally mixed)	0.19	1.2	7.1
Goat Milk (locally produced)	1.4	9.3	64
Beef (locally produced)	0.00091	0.016	0.32
Leafy Vegetables (locally produced)	0.00031	0.0032	0.028
Eggs (locally produced)	0.035	0.24	1.7
Cottage Cheese (locally produced)	0.00069	0.0081	0.086
Inhalation	0.021	0.077	0.29
Mother's milk (mother on Diet 1)	0.00011	0.0034	0.096
Prenatal exposure (mother on Diet 1)	--	--	--
Diet 1	0.7	3.5	20
Diet 2	0.28	1.5	8.9
Diet 3	0.23	1.3	7.4

Excess Lifetime Risk [ ]			
Diet 1	4.8E-06	1.5E-04	2.9E-03
Diet 2	2.3E-06	6.0E-05	1.3E-03
Diet 3	2.2E-06	5.4E-05	1.2E-03
Diet 4	1.4E-05	3.5E-04	8.0E-03

Relative Risk [ ]			
Diet 1	1.0045	1.1	3.2
Diet 2	1.002	1.04	1.9
Diet 3	1.0018	1.035	1.89
Diet 4	1.013	1.28	6.8

Probability of Causation [%]			
Diet 1	0.44	9.4	68
Diet 2	0.20	3.9	47
Diet 3	0.18	3.4	47
Diet 4	1.33	21.6	85

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	4.4	26	170
Commercial Milk (locally produced)	1.1	8.7	61
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	8.3	70	630
Beef (locally produced)	0.0062	0.11	2.7
Leafy Vegetables (locally produced)	0.0016	0.018	0.17
Eggs (locally produced)	0.21	1.7	15
Cottage Cheese (locally produced)	0.0056	0.063	0.78
Inhalation	0.075	0.3	1.2
Mother's milk (mother on Diet 1)	0.0017	0.045	1.3
Prenatal exposure (mother on Diet 1)	0.012	0.13	1.4
Diet 1	4.8	28	190
Diet 2	1.8	11	77
Diet 3	0.31	1.5	9.1

Excess Lifetime Risk [ ]			
Diet 1	4.6E-04	7.8E-03	1.1E-01
Diet 2	2.3E-04	2.8E-03	3.8E-02
Diet 3	3.6E-05	3.8E-04	4.3E-03
Diet 4	1.2E-03	1.9E-02	2.6E-01

Relative Risk [ ]			
Diet 1	1.18	2.9	23
Diet 2	1.069	1.72	11
Diet 3	1.011	1.094	2.2
Diet 4	1.4	5.1	81

Probability of Causation [%]			
Diet 1	15.21	64.9	96
Diet 2	6.43	41.7	91
Diet 3	1.10	8.6	54
Diet 4	28.39	80.2	99

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	4.4	25	170
Commercial Milk (locally produced)	1.2	8.3	64
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	7.9	73	560
Beef (locally produced)	0.0065	0.11	2.5
Leafy Vegetables (locally produced)	0.0016	0.018	0.17
Eggs (locally produced)	0.24	1.7	14
Cottage Cheese (locally produced)	0.0053	0.063	0.68
Inhalation	0.07	0.3	1.1
Mother's milk (mother on Diet 1)	0.0017	0.045	1.3
Prenatal exposure (mother on Diet 1)	0.012	0.13	1.4
Diet 1	5	28	190
Diet 2	1.7	11	78
Diet 3	0.29	1.5	9.9

Excess Lifetime Risk [ ]			
Diet 1	5.4E-05	2.1E-03	3.6E-02
Diet 2	3.1E-05	7.5E-04	1.7E-02
Diet 3	4.4E-06	9.8E-05	2.1E-03
Diet 4	1.4E-04	4.7E-03	1.1E-01

Relative Risk [ ]			
Diet 1	1.071	2.3	30
Diet 2	1.026	1.52	14
Diet 3	1.0039	1.067	2.5
Diet 4	1.15	4.4	82

Probability of Causation [%]			
Diet 1	6.64	57.0	97
Diet 2	2.57	34.0	93
Diet 3	0.39	6.2	60
Diet 4	13.21	76.9	99

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	5.7	31	190
Commercial Milk (locally produced)	1.5	11	76
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	10	87	720
Beef (locally produced)	0.0068	0.13	3.2
Leafy Vegetables (locally produced)	0.0021	0.022	0.2
Eggs (locally produced)	0.27	2	17
Cottage Cheese (locally produced)	0.0068	0.077	0.86
Inhalation	0.088	0.36	1.4
Mother's milk (mother on Diet 1)	0.0019	0.057	1.4
Prenatal exposure (mother on Diet 1)	0.016	0.16	1.7
Diet 1	6.4	35	210
Diet 2	2.1	14	95
Diet 3	0.34	1.6	9.2

Excess Lifetime Risk [ ]			
Diet 1	5.9E-04	9.1E-03	1.4E-01
Diet 2	2.9E-04	3.4E-03	4.8E-02
Diet 3	3.9E-05	4.0E-04	4.5E-03
Diet 4	1.4E-03	2.3E-02	3.0E-01

Relative Risk [ ]			
Diet 1	1.23	3.4	25
Diet 2	1.088	1.9	13
Diet 3	1.012	1.1	2.2
Diet 4	1.54	6.3	94

Probability of Causation [%]			
Diet 1	18.73	70.9	96
Diet 2	8.07	47.4	92
Diet 3	1.21	9.1	54
Diet 4	35.03	84.1	99

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	5.4	33	180
Commercial Milk (locally produced)	1.5	11	75
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	9.3	87	650
Beef (locally produced)	0.0073	0.14	3
Leafy Vegetables (locally produced)	0.0019	0.022	0.2
Eggs (locally produced)	0.28	2.1	16
Cottage Cheese (locally produced)	0.0062	0.077	0.8
Inhalation	0.094	0.38	1.4
Mother's milk (mother on Diet 1)	0.0019	0.057	1.4
Prenatal exposure (mother on Diet 1)	0.016	0.16	1.7
Diet 1	6.2	36	200
Diet 2	2.2	14	93
Diet 3	0.31	1.6	10

Excess Lifetime Risk [ ]			
Diet 1	6.9E-05	2.5E-03	4.1E-02
Diet 2	3.3E-05	9.5E-04	2.0E-02
Diet 3	4.6E-06	1.1E-04	2.1E-03
Diet 4	1.6E-04	5.7E-03	1.2E-01

Relative Risk [ ]			
Diet 1	1.088	2.5	36
Diet 2	1.032	1.64	14
Diet 3	1.0042	1.07	2.5
Diet 4	1.19	5.1	91

Probability of Causation [%]			
Diet 1	8.05	60.3	97
Diet 2	3.09	39.1	93
Diet 3	0.42	6.5	60
Diet 4	16.10	80.5	99

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.7	43
Commercial Milk (locally produced)	0.29	2.3	16
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0017	0.028	0.72
Leafy Vegetables (locally produced)	0.00039	0.0048	0.045
Eggs (locally produced)	0.052	0.44	3.6
Cottage Cheese (locally produced)	0.0015	0.016	0.2
Inhalation	0.02	0.08	0.31
Mother's milk (mother on Diet 1)	0.00042	0.012	0.32
Prenatal exposure (mother on Diet 1)	0.0032	0.035	0.37
Diet 1	1.2	7.4	47
Diet 2	0.44	3	20
Diet 3	0.21	1.3	8.2

Excess Lifetime Risk [ ]			
Diet 1	1.3E-04	2.0E-03	2.8E-02
Diet 2	6.0E-05	7.4E-04	1.0E-02
Diet 3	2.9E-05	3.1E-04	4.1E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.045	1.5	6.7
Diet 2	1.017	1.19	3.6
Diet 3	1.0087	1.082	2.1
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	4.27	32.4	84
Diet 2	1.68	15.6	70
Diet 3	0.86	7.6	52
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.8	44
Commercial Milk (locally produced)	0.29	2.3	17
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0017	0.028	0.72
Leafy Vegetables (locally produced)	0.00039	0.0045	0.045
Eggs (locally produced)	0.058	0.42	3.5
Cottage Cheese (locally produced)	0.0014	0.017	0.19
Inhalation	0.018	0.082	0.32
Mother's milk (mother on Diet 1)	0.00042	0.012	0.32
Prenatal exposure (mother on Diet 1)	0.0032	0.035	0.37
Diet 1	1.2	7.6	48
Diet 2	0.44	3	21
Diet 3	0.21	1.2	9.1

Excess Lifetime Risk [ ]			
Diet 1	1.4E-05	5.4E-04	9.0E-03
Diet 2	7.5E-06	2.0E-04	4.5E-03
Diet 3	3.7E-06	8.4E-05	1.9E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.018	1.34	9.1
Diet 2	1.0067	1.13	4.5
Diet 3	1.0029	1.057	2.4
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	1.74	24.7	88
Diet 2	0.67	11.3	77
Diet 3	0.29	5.4	58
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3	18	120
Commercial Milk (locally produced)	0.82	6.1	45
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.004	0.078	2
Leafy Vegetables (locally produced)	0.0012	0.013	0.12
Eggs (locally produced)	0.15	1.2	9.2
Cottage Cheese (locally produced)	0.0039	0.044	0.53
Inhalation	0.054	0.21	0.86
Mother's milk (mother on Diet 1)	0.0011	0.032	0.85
Prenatal exposure (mother on Diet 1)	0.0096	0.09	1
Diet 1	3.3	19	130
Diet 2	1.2	8	57
Diet 3	0.28	1.4	8.7

Excess Lifetime Risk [ ]			
Diet 1	3.4E-04	5.3E-03	7.7E-02
Diet 2	1.7E-04	2.0E-03	2.7E-02
Diet 3	3.3E-05	3.5E-04	4.2E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.12	2.4	16
Diet 2	1.049	1.51	7.9
Diet 3	1.01	1.089	2.1
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	10.96	57.4	93
Diet 2	4.65	33.6	87
Diet 3	1.02	8.1	53
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.2	18	120
Commercial Milk (locally produced)	0.84	6	48
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0044	0.074	2
Leafy Vegetables (locally produced)	0.0012	0.013	0.12
Eggs (locally produced)	0.16	1.1	9.1
Cottage Cheese (locally produced)	0.0039	0.045	0.5
Inhalation	0.054	0.22	0.83
Mother's milk (mother on Diet 1)	0.0011	0.032	0.85
Prenatal exposure (mother on Diet 1)	0.0096	0.09	1
Diet 1	3.5	20	130
Diet 2	1.3	7.7	57
Diet 3	0.27	1.4	9.6

Excess Lifetime Risk [ ]			
Diet 1	3.8E-05	1.4E-03	2.6E-02
Diet 2	1.9E-05	5.6E-04	1.2E-02
Diet 3	4.2E-06	9.4E-05	2.0E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.052	1.89	21
Diet 2	1.018	1.36	9.5
Diet 3	1.0035	1.062	2.5
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	4.89	46.9	95
Diet 2	1.76	26.4	89
Diet 3	0.34	5.9	59
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.9	17	120
Commercial Milk (locally produced)	0.81	6	44
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	5.3	48	420
Beef (locally produced)	0.0039	0.077	1.8
Leafy Vegetables (locally produced)	0.0012	0.013	0.12
Eggs (locally produced)	0.15	1.2	9
Cottage Cheese (locally produced)	0.0037	0.042	0.53
Inhalation	0.055	0.22	0.88
Mother's milk (mother on Diet 1)	0.001	0.031	0.85
Prenatal exposure (mother on Diet 1)	0.0096	0.09	0.96
Diet 1	3.3	19	130
Diet 2	1.2	7.9	57
Diet 3	0.28	1.4	8.8

Excess Lifetime Risk [ ]			
Diet 1	3.3E-04	5.2E-03	7.5E-02
Diet 2	1.7E-04	1.9E-03	2.6E-02
Diet 3	3.4E-05	3.5E-04	4.2E-03
Diet 4	8.1E-04	1.3E-02	2.0E-01

Relative Risk [ ]			
Diet 1	1.12	2.3	15
Diet 2	1.047	1.51	7.5
Diet 3	1.01	1.089	2.1
Diet 4	1.28	4	53

Probability of Causation [%]			
Diet 1	10.93	56.9	93
Diet 2	4.47	33.5	86
Diet 3	1.01	8.2	53
Diet 4	21.71	74.5	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**  
**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.3	18	110
Commercial Milk (locally produced)	0.82	5.9	46
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	5.1	48	370
Beef (locally produced)	0.0043	0.074	1.8
Leafy Vegetables (locally produced)	0.0011	0.012	0.11
Eggs (locally produced)	0.16	1.1	8.9
Cottage Cheese (locally produced)	0.0037	0.043	0.47
Inhalation	0.053	0.22	0.84
Mother's milk (mother on Diet 1)	0.001	0.031	0.85
Prenatal exposure (mother on Diet 1)	0.0096	0.09	0.96
Diet 1	3.6	20	120
Diet 2	1.2	7.7	56
Diet 3	0.27	1.4	9.6

Excess Lifetime Risk [ ]			
Diet 1	3.5E-05	1.4E-03	2.6E-02
Diet 2	1.9E-05	5.5E-04	1.2E-02
Diet 3	4.1E-06	9.4E-05	2.0E-03
Diet 4	9.7E-05	3.3E-03	7.6E-02

Relative Risk [ ]			
Diet 1	1.051	1.89	20
Diet 2	1.018	1.35	9.3
Diet 3	1.0035	1.062	2.5
Diet 4	1.11	3.2	51

Probability of Causation [%]			
Diet 1	4.89	46.7	95
Diet 2	1.73	26.1	89
Diet 3	0.35	5.9	60
Diet 4	10.21	68.8	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.43	2.5	20
Commercial Milk (locally produced)	0.1	0.86	7.3
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	0.75	6.6	68
Beef (locally produced)	0.00055	0.011	0.25
Leafy Vegetables (locally produced)	0.00015	0.0018	0.019
Eggs (locally produced)	0.02	0.17	1.4
Cottage Cheese (locally produced)	0.00051	0.0064	0.096
Inhalation	0.008	0.032	0.14
Mother's milk (mother on Diet 1)	0.00017	0.0045	0.13
Prenatal exposure (mother on Diet 1)	0.0014	0.013	0.15
Diet 1	0.48	2.7	21
Diet 2	0.17	1.1	8.8
Diet 3	0.19	1.2	8

Excess Lifetime Risk [ ]			
Diet 1	4.4E-05	7.5E-04	1.2E-02
Diet 2	2.4E-05	2.8E-04	4.2E-03
Diet 3	2.7E-05	3.0E-04	4.1E-03
Diet 4	1.1E-04	1.8E-03	3.3E-02

Relative Risk [ ]			
Diet 1	1.017	1.19	3.4
Diet 2	1.0064	1.071	2
Diet 3	1.0078	1.079	2.1
Diet 4	1.038	1.42	9.2

Probability of Causation [%]			
Diet 1	1.63	15.9	71
Diet 2	0.63	6.6	50
Diet 3	0.77	7.3	52
Diet 4	3.64	29.5	89

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.44	2.6	19
Commercial Milk (locally produced)	0.11	0.82	6.7
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.76	7	61
Beef (locally produced)	0.00058	0.011	0.25
Leafy Vegetables (locally produced)	0.00015	0.0018	0.018
Eggs (locally produced)	0.023	0.17	1.2
Cottage Cheese (locally produced)	0.00046	0.0061	0.078
Inhalation	0.0083	0.032	0.14
Mother's milk (mother on Diet 1)	0.00017	0.0045	0.13
Prenatal exposure (mother on Diet 1)	0.0014	0.013	0.15
Diet 1	0.49	2.8	21
Diet 2	0.17	1.1	8.4
Diet 3	0.19	1.2	9

Excess Lifetime Risk [ ]			
Diet 1	5.3E-06	1.9E-04	4.0E-03
Diet 2	2.7E-06	7.6E-05	1.7E-03
Diet 3	3.3E-06	8.0E-05	1.9E-03
Diet 4	1.4E-05	4.6E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.0063	1.14	3.9
Diet 2	1.0023	1.051	2.4
Diet 3	1.0028	1.055	2.3
Diet 4	1.014	1.33	8.7

Probability of Causation [%]			
Diet 1	0.62	11.9	74
Diet 2	0.23	4.8	57
Diet 3	0.28	5.2	57
Diet 4	1.35	24.6	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0028	0.032	0.38
Inhalation	0.039	0.16	0.66
Mother's milk (mother on Diet 3)	0.00013	0.0023	0.027
Prenatal exposure (mother on Diet 3)	0.0011	0.0065	0.051
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.25	1.4	8.6

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	3.2E-05	3.3E-04	4.2E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0097	1.086	2.1
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.97	7.9	53
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0026	0.033	0.34
Inhalation	0.039	0.17	0.62
Mother's milk (mother on Diet 3)	0.00013	0.0023	0.027
Prenatal exposure (mother on Diet 3)	0.0011	0.0065	0.051
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.25	1.3	9.4

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	4.0E-06	8.9E-05	2.0E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0032	1.06	2.4
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.32	5.7	59
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.9	17	100
Commercial Milk (locally produced)	0.82	5.5	45
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	5.4	45	380
Beef (locally produced)	0.0034	0.076	1.8
Leafy Vegetables (locally produced)	0.0011	0.012	0.11
Eggs (locally produced)	0.14	1.1	8.2
Cottage Cheese (locally produced)	0.0036	0.042	0.52
Inhalation	0.053	0.21	0.85
Mother's milk (mother on Diet 1)	0.001	0.029	0.79
Prenatal exposure (mother on Diet 1)	0.0093	0.088	0.88
Diet 1	3.3	19	110
Diet 2	1.2	7.4	57
Diet 3	0.27	1.4	8.8

Excess Lifetime Risk [ ]			
Diet 1	3.4E-04	4.9E-03	7.4E-02
Diet 2	1.6E-04	1.7E-03	2.6E-02
Diet 3	3.3E-05	3.5E-04	4.3E-03
Diet 4	8.3E-04	1.3E-02	2.0E-01

Relative Risk [ ]			
Diet 1	1.13	2.3	14
Diet 2	1.043	1.49	7.4
Diet 3	1.01	1.089	2.1
Diet 4	1.3	3.8	46

Probability of Causation [%]			
Diet 1	11.55	56.3	93
Diet 2	4.16	32.7	87
Diet 3	1.02	8.1	53
Diet 4	22.86	73.7	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.1	17	96
Commercial Milk (locally produced)	0.82	5.4	46
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	5.1	47	350
Beef (locally produced)	0.0037	0.073	1.7
Leafy Vegetables (locally produced)	0.0012	0.012	0.11
Eggs (locally produced)	0.16	1.1	8.2
Cottage Cheese (locally produced)	0.0033	0.042	0.42
Inhalation	0.054	0.21	0.86
Mother's milk (mother on Diet 1)	0.001	0.029	0.79
Prenatal exposure (mother on Diet 1)	0.0093	0.088	0.88
Diet 1	3.4	19	100
Diet 2	1.2	7.3	54
Diet 3	0.27	1.4	9.6

Excess Lifetime Risk [ ]			
Diet 1	3.7E-05	1.4E-03	2.2E-02
Diet 2	1.8E-05	4.9E-04	1.1E-02
Diet 3	4.2E-06	9.4E-05	2.0E-03
Diet 4	8.7E-05	3.0E-03	6.3E-02

Relative Risk [ ]			
Diet 1	1.047	1.84	20
Diet 2	1.018	1.33	9.3
Diet 3	1.0036	1.061	2.5
Diet 4	1.1	3.2	45

Probability of Causation [%]			
Diet 1	4.52	45.5	95
Diet 2	1.74	24.8	89
Diet 3	0.36	5.8	60
Diet 4	9.43	68.6	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.56	3.4	25
Commercial Milk (locally produced)	0.15	1.1	9.8
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	1.2	9.1	87
Beef (locally produced)	0.00079	0.015	0.33
Leafy Vegetables (locally produced)	0.00021	0.0025	0.025
Eggs (locally produced)	0.026	0.23	1.9
Cottage Cheese (locally produced)	0.00076	0.0085	0.12
Inhalation	0.01	0.044	0.19
Mother's milk (mother on Diet 1)	0.00019	0.0061	0.17
Prenatal exposure (mother on Diet 1)	0.0019	0.018	0.23
Diet 1	0.62	3.7	28
Diet 2	0.23	1.5	12
Diet 3	0.2	1.2	8.1

Excess Lifetime Risk [ ]			
Diet 1	6.6E-05	1.0E-03	1.7E-02
Diet 2	2.6E-05	3.9E-04	5.3E-03
Diet 3	2.7E-05	3.1E-04	4.1E-03
Diet 4	1.5E-04	2.6E-03	4.1E-02

Relative Risk [ ]			
Diet 1	1.026	1.26	3.9
Diet 2	1.0099	1.096	2.5
Diet 3	1.0081	1.08	2.1
Diet 4	1.053	1.57	12

Probability of Causation [%]			
Diet 1	2.51	20.4	74
Diet 2	0.98	8.8	59
Diet 3	0.81	7.4	52
Diet 4	5.01	36.1	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.55	3.5	24
Commercial Milk (locally produced)	0.16	1.1	9.6
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	1.1	9.7	88
Beef (locally produced)	0.00084	0.014	0.32
Leafy Vegetables (locally produced)	0.00022	0.0025	0.024
Eggs (locally produced)	0.031	0.23	1.8
Cottage Cheese (locally produced)	0.00074	0.0086	0.1
Inhalation	0.011	0.045	0.2
Mother's milk (mother on Diet 1)	0.00019	0.0061	0.17
Prenatal exposure (mother on Diet 1)	0.0019	0.018	0.23
Diet 1	0.61	3.9	26
Diet 2	0.24	1.5	12
Diet 3	0.2	1.2	9.1

Excess Lifetime Risk [ ]			
Diet 1	7.0E-06	2.7E-04	5.0E-03
Diet 2	3.8E-06	1.0E-04	2.3E-03
Diet 3	3.5E-06	8.1E-05	1.9E-03
Diet 4	1.9E-05	6.4E-04	1.5E-02

Relative Risk [ ]			
Diet 1	1.0083	1.18	5.1
Diet 2	1.003	1.069	2.8
Diet 3	1.0028	1.056	2.3
Diet 4	1.018	1.46	10.1

Probability of Causation [%]			
Diet 1	0.82	15.0	80
Diet 2	0.30	6.4	64
Diet 3	0.28	5.3	57
Diet 4	1.80	31.5	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0016	0.019	0.21
Inhalation	0.023	0.093	0.4
Mother's milk (mother on Diet 3)	0.00011	0.0019	0.024
Prenatal exposure (mother on Diet 3)	0.00087	0.0055	0.044
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.22	1.3	8.3

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.9E-05	3.2E-04	4.1E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.009	1.082	2.1
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.89	7.6	52
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0015	0.019	0.19
Inhalation	0.025	0.094	0.38
Mother's milk (mother on Diet 3)	0.00011	0.0019	0.024
Prenatal exposure (mother on Diet 3)	0.00087	0.0055	0.044
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.22	1.2	9.2

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	3.8E-06	8.5E-05	1.9E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.003	1.057	2.4
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.29	5.4	58
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.51	3.3	24
Commercial Milk (locally produced)	0.14	1.1	10
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	0.96	8.8	84
Beef (locally produced)	0.00078	0.014	0.37
Leafy Vegetables (locally produced)	0.00021	0.0022	0.022
Eggs (locally produced)	0.025	0.21	1.9
Cottage Cheese (locally produced)	0.00067	0.0081	0.11
Inhalation	0.011	0.042	0.18
Mother's milk (mother on Diet 1)	0.00022	0.0058	0.16
Prenatal exposure (mother on Diet 1)	0.0019	0.017	0.2
Diet 1	0.57	3.7	27
Diet 2	0.22	1.4	12
Diet 3	0.19	1.2	8.1

Excess Lifetime Risk [ ]			
Diet 1	5.9E-05	1.0E-03	1.5E-02
Diet 2	2.8E-05	3.6E-04	5.5E-03
Diet 3	2.7E-05	3.1E-04	4.1E-03
Diet 4	1.4E-04	2.4E-03	4.2E-02

Relative Risk [ ]			
Diet 1	1.021	1.24	3.8
Diet 2	1.0084	1.091	2.4
Diet 3	1.008	1.08	2.1
Diet 4	1.054	1.55	11

Probability of Causation [%]			
Diet 1	2.03	19.4	74
Diet 2	0.83	8.3	58
Diet 3	0.79	7.4	52
Diet 4	5.08	35.3	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.55	3.2	24
Commercial Milk (locally produced)	0.15	1.1	9.7
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.94	9.2	92
Beef (locally produced)	0.00083	0.014	0.34
Leafy Vegetables (locally produced)	0.00021	0.0023	0.024
Eggs (locally produced)	0.028	0.21	1.9
Cottage Cheese (locally produced)	0.00065	0.0081	0.11
Inhalation	0.0091	0.042	0.17
Mother's milk (mother on Diet 1)	0.00022	0.0058	0.16
Prenatal exposure (mother on Diet 1)	0.0019	0.017	0.2
Diet 1	0.6	3.6	26
Diet 2	0.22	1.4	12
Diet 3	0.2	1.2	9

Excess Lifetime Risk [ ]			
Diet 1	6.8E-06	2.5E-04	4.7E-03
Diet 2	3.4E-06	9.6E-05	2.0E-03
Diet 3	3.5E-06	8.1E-05	1.9E-03
Diet 4	1.7E-05	6.0E-04	1.3E-02

Relative Risk [ ]			
Diet 1	1.0089	1.17	4.9
Diet 2	1.0034	1.062	2.8
Diet 3	1.0028	1.055	2.3
Diet 4	1.019	1.42	12

Probability of Causation [%]			
Diet 1	0.88	14.4	80
Diet 2	0.34	5.9	64
Diet 3	0.28	5.2	57
Diet 4	1.91	29.3	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0024	0.027	0.33
Inhalation	0.036	0.14	0.58
Mother's milk (mother on Diet 3)	0.00012	0.0022	0.026
Prenatal exposure (mother on Diet 3)	0.0011	0.0064	0.047
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.25	1.3	8.5

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	3.1E-05	3.3E-04	4.2E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0095	1.085	2.1
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.95	7.8	52
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0022	0.028	0.28
Inhalation	0.036	0.14	0.57
Mother's milk (mother on Diet 3)	0.00012	0.0022	0.026
Prenatal exposure (mother on Diet 3)	0.0011	0.0064	0.047
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.24	1.3	9.4

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	4.0E-06	8.8E-05	2.0E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0032	1.059	2.4
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.32	5.6	59
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.7	15	100
Commercial Milk (locally produced)	0.75	5.5	40
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	5.4	43	380
Beef (locally produced)	0.0037	0.068	1.5
Leafy Vegetables (locally produced)	0.0011	0.012	0.11
Eggs (locally produced)	0.13	1	8.2
Cottage Cheese (locally produced)	0.0036	0.039	0.5
Inhalation	0.05	0.2	0.87
Mother's milk (mother on Diet 1)	0.00099	0.029	0.73
Prenatal exposure (mother on Diet 1)	0.0087	0.084	0.89
Diet 1	3	17	110
Diet 2	1.2	7.3	51
Diet 3	0.28	1.4	8.8

Excess Lifetime Risk [ ]			
Diet 1	3.1E-04	4.7E-03	6.8E-02
Diet 2	1.4E-04	1.8E-03	2.3E-02
Diet 3	3.3E-05	3.5E-04	4.3E-03
Diet 4	7.3E-04	1.2E-02	1.7E-01

Relative Risk [ ]			
Diet 1	1.11	2.2	13
Diet 2	1.045	1.44	6.9
Diet 3	1.01	1.089	2.1
Diet 4	1.24	3.7	47

Probability of Causation [%]			
Diet 1	10.25	54.7	92
Diet 2	4.35	30.5	85
Diet 3	1.01	8.2	53
Diet 4	19.44	72.6	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.7	16	98
Commercial Milk (locally produced)	0.78	5.3	42
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	5.2	45	350
Beef (locally produced)	0.0038	0.068	1.5
Leafy Vegetables (locally produced)	0.0011	0.011	0.11
Eggs (locally produced)	0.15	1	7.8
Cottage Cheese (locally produced)	0.0035	0.04	0.41
Inhalation	0.053	0.21	0.81
Mother's milk (mother on Diet 1)	0.00099	0.029	0.73
Prenatal exposure (mother on Diet 1)	0.0087	0.084	0.89
Diet 1	3.1	18	110
Diet 2	1.2	7	53
Diet 3	0.27	1.4	9.6

Excess Lifetime Risk [ ]			
Diet 1	3.4E-05	1.2E-03	2.1E-02
Diet 2	1.8E-05	4.8E-04	1.0E-02
Diet 3	4.2E-06	9.2E-05	2.0E-03
Diet 4	8.8E-05	2.9E-03	5.8E-02

Relative Risk [ ]			
Diet 1	1.043	1.77	19
Diet 2	1.016	1.32	9.3
Diet 3	1.0034	1.062	2.5
Diet 4	1.086	3.1	44

Probability of Causation [%]			
Diet 1	4.14	43.5	95
Diet 2	1.58	24.3	89
Diet 3	0.34	5.8	59
Diet 4	7.93	67.6	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.41	2.5	18
Commercial Milk (locally produced)	0.11	0.82	7.3
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	0.76	6.8	64
Beef (locally produced)	0.00055	0.011	0.27
Leafy Vegetables (locally produced)	0.00014	0.0017	0.018
Eggs (locally produced)	0.02	0.16	1.4
Cottage Cheese (locally produced)	0.0005	0.0061	0.074
Inhalation	0.0079	0.032	0.15
Mother's milk (mother on Diet 1)	0.00016	0.0044	0.13
Prenatal exposure (mother on Diet 1)	0.0013	0.013	0.15
Diet 1	0.46	2.7	20
Diet 2	0.18	1.1	9
Diet 3	0.19	1.2	8

Excess Lifetime Risk [ ]			
Diet 1	4.4E-05	7.5E-04	1.3E-02
Diet 2	2.3E-05	2.7E-04	4.2E-03
Diet 3	2.7E-05	3.0E-04	4.1E-03
Diet 4	1.1E-04	1.8E-03	3.1E-02

Relative Risk [ ]			
Diet 1	1.016	1.19	3.2
Diet 2	1.0057	1.071	2
Diet 3	1.0078	1.079	2.1
Diet 4	1.036	1.43	8.5

Probability of Causation [%]			
Diet 1	1.62	15.7	68
Diet 2	0.57	6.6	51
Diet 3	0.77	7.3	52
Diet 4	3.52	29.8	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.39	2.5	18
Commercial Milk (locally produced)	0.12	0.82	7.2
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.71	7	60
Beef (locally produced)	0.00056	0.011	0.26
Leafy Vegetables (locally produced)	0.00014	0.0017	0.018
Eggs (locally produced)	0.023	0.16	1.4
Cottage Cheese (locally produced)	0.00049	0.0062	0.071
Inhalation	0.0079	0.033	0.14
Mother's milk (mother on Diet 1)	0.00016	0.0044	0.13
Prenatal exposure (mother on Diet 1)	0.0013	0.013	0.15
Diet 1	0.45	2.7	19
Diet 2	0.18	1.1	9
Diet 3	0.19	1.2	9

Excess Lifetime Risk [ ]			
Diet 1	4.9E-06	1.9E-04	3.5E-03
Diet 2	2.5E-06	7.5E-05	1.5E-03
Diet 3	3.3E-06	8.0E-05	1.9E-03
Diet 4	1.3E-05	4.7E-04	1.1E-02

Relative Risk [ ]			
Diet 1	1.0063	1.13	4.1
Diet 2	1.0023	1.049	2.3
Diet 3	1.0028	1.055	2.3
Diet 4	1.012	1.32	8.8

Probability of Causation [%]			
Diet 1	0.63	11.4	75
Diet 2	0.23	4.7	56
Diet 3	0.28	5.2	57
Diet 4	1.19	24.3	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.5	14	94
Commercial Milk (locally produced)	0.68	5	36
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	4.7	39	340
Beef (locally produced)	0.0031	0.062	1.5
Leafy Vegetables (locally produced)	0.00095	0.01	0.099
Eggs (locally produced)	0.12	0.96	7
Cottage Cheese (locally produced)	0.0032	0.035	0.43
Inhalation	0.049	0.19	0.79
Mother's milk (mother on Diet 1)	0.0009	0.026	0.68
Prenatal exposure (mother on Diet 1)	0.0082	0.074	0.76
Diet 1	2.8	16	100
Diet 2	1	6.5	46
Diet 3	0.27	1.4	8.7

Excess Lifetime Risk [ ]			
Diet 1	2.8E-04	4.2E-03	6.1E-02
Diet 2	1.5E-04	1.6E-03	2.0E-02
Diet 3	3.4E-05	3.4E-04	4.2E-03
Diet 4	6.9E-04	1.1E-02	1.5E-01

Relative Risk [ ]			
Diet 1	1.097	2.1	12
Diet 2	1.04	1.42	6.1
Diet 3	1.01	1.088	2.1
Diet 4	1.23	3.4	45

Probability of Causation [%]			
Diet 1	8.84	52.0	92
Diet 2	3.82	29.6	84
Diet 3	1.00	8.1	53
Diet 4	18.69	70.6	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.9	15	91
Commercial Milk (locally produced)	0.7	4.9	37
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	4.6	41	300
Beef (locally produced)	0.0033	0.062	1.4
Leafy Vegetables (locally produced)	0.00094	0.01	0.095
Eggs (locally produced)	0.14	0.95	6.8
Cottage Cheese (locally produced)	0.0029	0.035	0.4
Inhalation	0.049	0.19	0.75
Mother's milk (mother on Diet 1)	0.0009	0.026	0.68
Prenatal exposure (mother on Diet 1)	0.0082	0.074	0.76
Diet 1	3.2	16	99
Diet 2	1	6.4	47
Diet 3	0.27	1.4	9.6

Excess Lifetime Risk [ ]			
Diet 1	3.1E-05	1.1E-03	2.1E-02
Diet 2	1.7E-05	4.3E-04	9.7E-03
Diet 3	4.2E-06	9.1E-05	2.0E-03
Diet 4	8.2E-05	2.7E-03	5.6E-02

Relative Risk [ ]			
Diet 1	1.038	1.73	17
Diet 2	1.014	1.29	8.1
Diet 3	1.0035	1.061	2.5
Diet 4	1.083	2.9	40

Probability of Causation [%]			
Diet 1	3.63	42.1	94
Diet 2	1.43	22.7	87
Diet 3	0.35	5.8	59
Diet 4	7.67	65.0	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1	6.1	42
Commercial Milk (locally produced)	0.28	2.1	16
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	2.1	16	150
Beef (locally produced)	0.0015	0.026	0.58
Leafy Vegetables (locally produced)	0.0004	0.0044	0.044
Eggs (locally produced)	0.051	0.39	3.2
Cottage Cheese (locally produced)	0.0013	0.015	0.2
Inhalation	0.019	0.079	0.34
Mother's milk (mother on Diet 1)	0.0004	0.011	0.29
Prenatal exposure (mother on Diet 1)	0.0032	0.032	0.34
Diet 1	1.1	6.8	46
Diet 2	0.43	2.8	20
Diet 3	0.22	1.3	8.2

Excess Lifetime Risk [ ]			
Diet 1	1.2E-04	1.8E-03	2.6E-02
Diet 2	5.8E-05	6.8E-04	8.9E-03
Diet 3	2.9E-05	3.1E-04	4.1E-03
Diet 4	2.8E-04	4.6E-03	6.9E-02

Relative Risk [ ]			
Diet 1	1.042	1.45	5.9
Diet 2	1.017	1.17	3.2
Diet 3	1.0086	1.082	2.1
Diet 4	1.093	2	19

Probability of Causation [%]			
Diet 1	3.98	30.3	82
Diet 2	1.68	14.3	67
Diet 3	0.86	7.6	52
Diet 4	8.43	48.9	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.3	40
Commercial Milk (locally produced)	0.3	2.1	16
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	1.9	17	140
Beef (locally produced)	0.0015	0.026	0.57
Leafy Vegetables (locally produced)	0.00041	0.0043	0.043
Eggs (locally produced)	0.058	0.39	3
Cottage Cheese (locally produced)	0.0012	0.015	0.18
Inhalation	0.02	0.08	0.31
Mother's milk (mother on Diet 1)	0.0004	0.011	0.29
Prenatal exposure (mother on Diet 1)	0.0032	0.032	0.34
Diet 1	1.2	6.8	45
Diet 2	0.44	2.7	21
Diet 3	0.21	1.2	9.2

Excess Lifetime Risk [ ]			
Diet 1	1.4E-05	4.6E-04	8.9E-03
Diet 2	6.9E-06	1.8E-04	3.9E-03
Diet 3	3.7E-06	8.3E-05	1.9E-03
Diet 4	3.6E-05	1.1E-03	2.5E-02

Relative Risk [ ]			
Diet 1	1.016	1.31	7.8
Diet 2	1.0058	1.12	4.2
Diet 3	1.0029	1.057	2.4
Diet 4	1.033	1.8	18

Probability of Causation [%]			
Diet 1	1.57	23.0	86
Diet 2	0.58	10.6	75
Diet 3	0.29	5.4	58
Diet 4	3.15	43.0	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0015	0.016	0.2
Inhalation	0.022	0.087	0.36
Mother's milk (mother on Diet 3)	0.00011	0.0019	0.024
Prenatal exposure (mother on Diet 3)	0.00085	0.0053	0.045
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.22	1.3	8.2

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.9E-05	3.2E-04	4.1E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0088	1.082	2.1
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.87	7.6	52
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0015	0.016	0.18
Inhalation	0.022	0.088	0.34
Mother's milk (mother on Diet 3)	0.00011	0.0019	0.024
Prenatal exposure (mother on Diet 3)	0.00085	0.0053	0.045
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.22	1.2	9.2

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	3.7E-06	8.4E-05	1.9E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0029	1.057	2.4
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.29	5.4	58
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.2	7.2	48
Commercial Milk (locally produced)	0.34	2.5	19
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	2.4	20	160
Beef (locally produced)	0.0016	0.032	0.86
Leafy Vegetables (locally produced)	0.0005	0.0054	0.049
Eggs (locally produced)	0.061	0.49	3.6
Cottage Cheese (locally produced)	0.0016	0.018	0.22
Inhalation	0.025	0.11	0.41
Mother's milk (mother on Diet 1)	0.00047	0.013	0.35
Prenatal exposure (mother on Diet 1)	0.0042	0.038	0.43
Diet 1	1.4	8	52
Diet 2	0.51	3.2	22
Diet 3	0.23	1.3	8.3

Excess Lifetime Risk [ ]			
Diet 1	1.4E-04	2.2E-03	3.4E-02
Diet 2	6.9E-05	8.4E-04	1.1E-02
Diet 3	2.9E-05	3.2E-04	4.1E-03
Diet 4	3.4E-04	5.4E-03	8.1E-02

Relative Risk [ ]			
Diet 1	1.052	1.57	6.6
Diet 2	1.02	1.21	3.7
Diet 3	1.009	1.083	2.1
Diet 4	1.11	2.2	24

Probability of Causation [%]			
Diet 1	4.90	36.3	85
Diet 2	1.97	17.5	73
Diet 3	0.89	7.7	52
Diet 4	10.15	55.3	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.3	7.6	48
Commercial Milk (locally produced)	0.35	2.5	20
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	2.2	20	150
Beef (locally produced)	0.0018	0.031	0.82
Leafy Vegetables (locally produced)	0.00051	0.0053	0.045
Eggs (locally produced)	0.069	0.47	3.7
Cottage Cheese (locally produced)	0.0017	0.019	0.21
Inhalation	0.026	0.1	0.41
Mother's milk (mother on Diet 1)	0.00047	0.013	0.35
Prenatal exposure (mother on Diet 1)	0.0042	0.038	0.43
Diet 1	1.5	8.3	53
Diet 2	0.52	3.2	23
Diet 3	0.22	1.2	9.3

Excess Lifetime Risk [ ]			
Diet 1	1.6E-05	5.9E-04	1.1E-02
Diet 2	8.4E-06	2.3E-04	5.0E-03
Diet 3	3.8E-06	8.4E-05	1.9E-03
Diet 4	4.1E-05	1.4E-03	3.0E-02

Relative Risk [ ]			
Diet 1	1.02	1.37	9.4
Diet 2	1.0076	1.15	4.3
Diet 3	1.003	1.057	2.4
Diet 4	1.042	1.93	23

Probability of Causation [%]			
Diet 1	1.99	26.9	89
Diet 2	0.76	13.2	77
Diet 3	0.30	5.4	58
Diet 4	4.07	48.2	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.4	8.1	53
Commercial Milk (locally produced)	0.39	2.8	20
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	2.6	23	200
Beef (locally produced)	0.0019	0.035	1
Leafy Vegetables (locally produced)	0.0005	0.006	0.056
Eggs (locally produced)	0.068	0.56	4
Cottage Cheese (locally produced)	0.0018	0.021	0.23
Inhalation	0.029	0.12	0.48
Mother's milk (mother on Diet 1)	0.00059	0.015	0.41
Prenatal exposure (mother on Diet 1)	0.0045	0.044	0.45
Diet 1	1.6	8.8	58
Diet 2	0.59	3.7	25
Diet 3	0.24	1.3	8.4

Excess Lifetime Risk [ ]			
Diet 1	1.6E-04	2.5E-03	3.8E-02
Diet 2	8.1E-05	9.4E-04	1.2E-02
Diet 3	3.0E-05	3.2E-04	4.2E-03
Diet 4	3.8E-04	6.4E-03	8.8E-02

Relative Risk [ ]			
Diet 1	1.057	1.63	7.3
Diet 2	1.023	1.24	4.3
Diet 3	1.0092	1.084	2.1
Diet 4	1.12	2.4	26

Probability of Causation [%]			
Diet 1	5.36	38.6	86
Diet 2	2.24	19.2	77
Diet 3	0.91	7.7	52
Diet 4	10.76	58.3	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.4	8.2	53
Commercial Milk (locally produced)	0.41	2.7	21
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	2.5	23	180
Beef (locally produced)	0.002	0.036	0.95
Leafy Vegetables (locally produced)	0.00052	0.006	0.055
Eggs (locally produced)	0.077	0.53	4
Cottage Cheese (locally produced)	0.0018	0.021	0.21
Inhalation	0.027	0.12	0.45
Mother's milk (mother on Diet 1)	0.00059	0.015	0.41
Prenatal exposure (mother on Diet 1)	0.0045	0.044	0.45
Diet 1	1.6	9.1	58
Diet 2	0.61	3.6	25
Diet 3	0.23	1.3	9.3

Excess Lifetime Risk [ ]			
Diet 1	2.0E-05	6.5E-04	1.1E-02
Diet 2	9.5E-06	2.4E-04	5.6E-03
Diet 3	3.9E-06	8.5E-05	2.0E-03
Diet 4	4.6E-05	1.6E-03	3.3E-02

Relative Risk [ ]			
Diet 1	1.023	1.42	10.7
Diet 2	1.0088	1.17	5
Diet 3	1.003	1.058	2.4
Diet 4	1.048	2.1	26

Probability of Causation [%]			
Diet 1	2.28	29.4	91
Diet 2	0.88	14.2	80
Diet 3	0.30	5.5	59
Diet 4	4.54	52.0	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.95	5.1	30
Commercial Milk (locally produced)	0.25	1.7	13
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0011	0.022	0.53
Leafy Vegetables (locally produced)	0.00035	0.0037	0.034
Eggs (locally produced)	0.045	0.33	2.4
Cottage Cheese (locally produced)	0.001	0.013	0.15
Inhalation	0.017	0.073	0.3
Mother's milk (mother on Diet 1)	0.00031	0.009	0.24
Prenatal exposure (mother on Diet 1)	0.003	0.028	0.28
Diet 1	1	5.6	33
Diet 2	0.38	2.2	16
Diet 3	0.21	1.3	8.2

Excess Lifetime Risk [ ]			
Diet 1	1.1E-04	1.5E-03	2.5E-02
Diet 2	5.4E-05	5.3E-04	8.5E-03
Diet 3	2.8E-05	3.1E-04	4.1E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.04	1.38	5.3
Diet 2	1.013	1.15	3
Diet 3	1.0087	1.082	2.1
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	3.88	27.6	81
Diet 2	1.31	12.8	67
Diet 3	0.86	7.5	52
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways  
Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways  
Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)  
Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.92	5.2	31
Commercial Milk (locally produced)	0.25	1.6	13
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0011	0.021	0.5
Leafy Vegetables (locally produced)	0.00037	0.0037	0.032
Eggs (locally produced)	0.05	0.34	2.4
Cottage Cheese (locally produced)	0.001	0.013	0.12
Inhalation	0.019	0.071	0.31
Mother's milk (mother on Diet 1)	0.00031	0.009	0.24
Prenatal exposure (mother on Diet 1)	0.003	0.028	0.28
Diet 1	1	5.6	33
Diet 2	0.39	2.1	16
Diet 3	0.21	1.2	9.2

Excess Lifetime Risk [ ]			
Diet 1	1.1E-05	4.1E-04	6.5E-03
Diet 2	5.4E-06	1.5E-04	3.1E-03
Diet 3	3.7E-06	8.3E-05	1.9E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.014	1.25	6.7
Diet 2	1.0054	1.093	3.4
Diet 3	1.0029	1.057	2.4
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	1.36	20.1	85
Diet 2	0.54	8.5	71
Diet 3	0.29	5.4	58
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.5	41
Commercial Milk (locally produced)	0.32	2.2	15
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	2	18	160
Beef (locally produced)	0.0015	0.028	0.67
Leafy Vegetables (locally produced)	0.00044	0.0046	0.042
Eggs (locally produced)	0.051	0.43	3.5
Cottage Cheese (locally produced)	0.0014	0.016	0.17
Inhalation	0.023	0.094	0.4
Mother's milk (mother on Diet 1)	0.00044	0.012	0.3
Prenatal exposure (mother on Diet 1)	0.0037	0.033	0.35
Diet 1	1.2	7.2	45
Diet 2	0.49	3	19
Diet 3	0.22	1.3	8.3

Excess Lifetime Risk [ ]			
Diet 1	1.2E-04	1.9E-03	2.6E-02
Diet 2	7.1E-05	7.2E-04	9.5E-03
Diet 3	2.9E-05	3.2E-04	4.1E-03
Diet 4	3.0E-04	4.8E-03	6.1E-02

Relative Risk [ ]			
Diet 1	1.048	1.5	6.1
Diet 2	1.017	1.19	3.3
Diet 3	1.009	1.082	2.1
Diet 4	1.11	2.1	18

Probability of Causation [%]			
Diet 1	4.58	33.1	83
Diet 2	1.67	15.7	70
Diet 3	0.89	7.6	52
Diet 4	9.63	52.3	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.7	39
Commercial Milk (locally produced)	0.33	2.1	17
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	2	18	140
Beef (locally produced)	0.0015	0.027	0.66
Leafy Vegetables (locally produced)	0.00041	0.0045	0.041
Eggs (locally produced)	0.06	0.42	3.3
Cottage Cheese (locally produced)	0.0013	0.016	0.16
Inhalation	0.023	0.096	0.39
Mother's milk (mother on Diet 1)	0.00044	0.012	0.3
Prenatal exposure (mother on Diet 1)	0.0037	0.033	0.35
Diet 1	1.2	7.3	43
Diet 2	0.49	2.9	21
Diet 3	0.22	1.2	9.3

Excess Lifetime Risk [ ]			
Diet 1	1.4E-05	5.1E-04	9.0E-03
Diet 2	6.7E-06	2.0E-04	3.9E-03
Diet 3	3.8E-06	8.4E-05	1.9E-03
Diet 4	3.9E-05	1.2E-03	2.5E-02

Relative Risk [ ]			
Diet 1	1.017	1.33	8
Diet 2	1.007	1.13	4.4
Diet 3	1.0029	1.057	2.4
Diet 4	1.034	1.84	21

Probability of Causation [%]			
Diet 1	1.65	24.6	87
Diet 2	0.70	11.5	77
Diet 3	0.29	5.4	59
Diet 4	3.29	45.6	95

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.5	8.6	53
Commercial Milk (locally produced)	0.42	3	20
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	2.9	24	210
Beef (locally produced)	0.002	0.038	0.93
Leafy Vegetables (locally produced)	0.00058	0.0064	0.058
Eggs (locally produced)	0.071	0.58	4.4
Cottage Cheese (locally produced)	0.0019	0.022	0.23
Inhalation	0.031	0.13	0.53
Mother's milk (mother on Diet 1)	0.00061	0.016	0.41
Prenatal exposure (mother on Diet 1)	0.0047	0.046	0.46
Diet 1	1.7	9.5	58
Diet 2	0.63	3.9	25
Diet 3	0.24	1.3	8.4

Excess Lifetime Risk [ ]			
Diet 1	1.8E-04	2.6E-03	4.1E-02
Diet 2	8.6E-05	9.9E-04	1.3E-02
Diet 3	3.1E-05	3.3E-04	4.2E-03
Diet 4	4.4E-04	6.7E-03	8.5E-02

Relative Risk [ ]			
Diet 1	1.065	1.67	7.4
Diet 2	1.025	1.26	4.3
Diet 3	1.0094	1.085	2.1
Diet 4	1.14	2.5	26

Probability of Causation [%]			
Diet 1	6.06	40.2	86
Diet 2	2.45	20.5	77
Diet 3	0.93	7.8	52
Diet 4	12.65	60.1	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.5	8.9	51
Commercial Milk (locally produced)	0.44	2.9	21
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	2.7	24	190
Beef (locally produced)	0.0021	0.038	0.87
Leafy Vegetables (locally produced)	0.00056	0.0063	0.055
Eggs (locally produced)	0.083	0.56	4.2
Cottage Cheese (locally produced)	0.0018	0.022	0.22
Inhalation	0.032	0.13	0.5
Mother's milk (mother on Diet 1)	0.00061	0.016	0.41
Prenatal exposure (mother on Diet 1)	0.0047	0.046	0.46
Diet 1	1.7	9.8	55
Diet 2	0.65	3.9	26
Diet 3	0.24	1.3	9.3

Excess Lifetime Risk [ ]			
Diet 1	2.0E-05	7.1E-04	1.2E-02
Diet 2	1.0E-05	2.6E-04	5.6E-03
Diet 3	4.0E-06	8.6E-05	2.0E-03
Diet 4	4.9E-05	1.6E-03	3.4E-02

Relative Risk [ ]			
Diet 1	1.025	1.45	10.6
Diet 2	1.0095	1.18	4.9
Diet 3	1.003	1.059	2.4
Diet 4	1.049	2.2	27

Probability of Causation [%]			
Diet 1	2.48	31.0	91
Diet 2	0.94	15.4	80
Diet 3	0.30	5.5	59
Diet 4	4.63	53.8	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.86	4.9	34
Commercial Milk (locally produced)	0.22	1.7	12
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	1.6	13	120
Beef (locally produced)	0.0012	0.021	0.47
Leafy Vegetables (locally produced)	0.00034	0.0035	0.034
Eggs (locally produced)	0.041	0.32	2.5
Cottage Cheese (locally produced)	0.0011	0.012	0.15
Inhalation	0.019	0.075	0.31
Mother's milk (mother on Diet 1)	0.00034	0.0085	0.24
Prenatal exposure (mother on Diet 1)	0.0027	0.026	0.26
Diet 1	0.97	5.4	37
Diet 2	0.35	2.3	15
Diet 3	0.21	1.3	8.2

Excess Lifetime Risk [ ]			
Diet 1	8.6E-05	1.5E-03	2.2E-02
Diet 2	4.7E-05	5.6E-04	7.4E-03
Diet 3	2.9E-05	3.1E-04	4.1E-03
Diet 4	2.2E-04	3.6E-03	5.4E-02

Relative Risk [ ]			
Diet 1	1.035	1.37	4.8
Diet 2	1.014	1.14	2.7
Diet 3	1.0086	1.082	2.1
Diet 4	1.075	1.8	15

Probability of Causation [%]			
Diet 1	3.34	26.7	79
Diet 2	1.37	12.3	62
Diet 3	0.85	7.6	52
Diet 4	6.97	44.5	93

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.86	5	32
Commercial Milk (locally produced)	0.23	1.6	12
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	1.5	14	110
Beef (locally produced)	0.0012	0.021	0.47
Leafy Vegetables (locally produced)	0.00033	0.0034	0.032
Eggs (locally produced)	0.045	0.32	2.4
Cottage Cheese (locally produced)	0.001	0.012	0.13
Inhalation	0.018	0.077	0.3
Mother's milk (mother on Diet 1)	0.00034	0.0085	0.24
Prenatal exposure (mother on Diet 1)	0.0027	0.026	0.26
Diet 1	0.99	5.5	36
Diet 2	0.35	2.2	15
Diet 3	0.21	1.2	9.2

Excess Lifetime Risk [ ]			
Diet 1	1.1E-05	3.8E-04	7.1E-03
Diet 2	5.8E-06	1.5E-04	3.1E-03
Diet 3	3.7E-06	8.3E-05	1.9E-03
Diet 4	2.8E-05	8.9E-04	2.1E-02

Relative Risk [ ]			
Diet 1	1.013	1.26	6.1
Diet 2	1.0049	1.098	3.4
Diet 3	1.0029	1.056	2.4
Diet 4	1.027	1.65	16

Probability of Causation [%]			
Diet 1	1.29	20.5	84
Diet 2	0.49	8.9	71
Diet 3	0.29	5.3	58
Diet 4	2.66	39.3	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.52	2.9	18
Commercial Milk (locally produced)	0.14	0.97	7.7
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	0.98	7.5	65
Beef (locally produced)	0.00065	0.013	0.31
Leafy Vegetables (locally produced)	0.00019	0.0021	0.019
Eggs (locally produced)	0.025	0.19	1.4
Cottage Cheese (locally produced)	0.0006	0.0074	0.086
Inhalation	0.01	0.04	0.17
Mother's milk (mother on Diet 1)	0.00017	0.0051	0.14
Prenatal exposure (mother on Diet 1)	0.0017	0.016	0.16
Diet 1	0.58	3.2	19
Diet 2	0.21	1.3	9.1
Diet 3	0.19	1.2	8.1

Excess Lifetime Risk [ ]			
Diet 1	6.2E-05	8.7E-04	1.4E-02
Diet 2	3.1E-05	3.1E-04	4.8E-03
Diet 3	2.7E-05	3.1E-04	4.1E-03
Diet 4	1.4E-04	2.2E-03	3.4E-02

Relative Risk [ ]			
Diet 1	1.022	1.22	3.4
Diet 2	1.0076	1.085	2.1
Diet 3	1.008	1.08	2.1
Diet 4	1.049	1.48	8.5

Probability of Causation [%]			
Diet 1	2.15	18.2	70
Diet 2	0.75	7.8	53
Diet 3	0.80	7.4	52
Diet 4	4.69	32.6	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.52	3	18
Commercial Milk (locally produced)	0.14	0.91	7.5
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.9	8	62
Beef (locally produced)	0.00065	0.013	0.29
Leafy Vegetables (locally produced)	0.0002	0.0021	0.018
Eggs (locally produced)	0.029	0.19	1.4
Cottage Cheese (locally produced)	0.00056	0.0073	0.071
Inhalation	0.01	0.04	0.17
Mother's milk (mother on Diet 1)	0.00017	0.0051	0.14
Prenatal exposure (mother on Diet 1)	0.0017	0.016	0.16
Diet 1	0.58	3.2	19
Diet 2	0.22	1.2	9.3
Diet 3	0.19	1.2	9

Excess Lifetime Risk [ ]			
Diet 1	6.6E-06	2.3E-04	3.7E-03
Diet 2	3.1E-06	8.7E-05	1.7E-03
Diet 3	3.4E-06	8.0E-05	1.9E-03
Diet 4	1.5E-05	5.2E-04	1.1E-02

Relative Risk [ ]			
Diet 1	1.0078	1.14	4.2
Diet 2	1.003	1.055	2.4
Diet 3	1.0028	1.055	2.3
Diet 4	1.019	1.38	8.4

Probability of Causation [%]			
Diet 1	0.78	12.5	76
Diet 2	0.30	5.2	58
Diet 3	0.28	5.2	57
Diet 4	1.87	27.7	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.2	6.8	44
Commercial Milk (locally produced)	0.33	2.4	16
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	2.2	18	160
Beef (locally produced)	0.0015	0.03	0.78
Leafy Vegetables (locally produced)	0.00049	0.005	0.046
Eggs (locally produced)	0.058	0.46	3.4
Cottage Cheese (locally produced)	0.0015	0.017	0.2
Inhalation	0.026	0.11	0.41
Mother's milk (mother on Diet 1)	0.00045	0.012	0.32
Prenatal exposure (mother on Diet 1)	0.0041	0.036	0.39
Diet 1	1.4	7.5	48
Diet 2	0.51	3.1	20
Diet 3	0.23	1.3	8.3

Excess Lifetime Risk [ ]			
Diet 1	1.3E-04	2.0E-03	3.1E-02
Diet 2	6.6E-05	7.8E-04	1.0E-02
Diet 3	2.9E-05	3.2E-04	4.1E-03
Diet 4	3.4E-04	5.1E-03	7.1E-02

Relative Risk [ ]			
Diet 1	1.048	1.53	6
Diet 2	1.019	1.2	3.4
Diet 3	1.009	1.083	2.1
Diet 4	1.11	2.2	22

Probability of Causation [%]			
Diet 1	4.61	34.7	83
Diet 2	1.90	16.7	71
Diet 3	0.89	7.7	52
Diet 4	9.76	53.9	95

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.3	7	43
Commercial Milk (locally produced)	0.35	2.3	18
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	2.1	19	140
Beef (locally produced)	0.0017	0.029	0.74
Leafy Vegetables (locally produced)	0.0005	0.0049	0.042
Eggs (locally produced)	0.064	0.44	3.5
Cottage Cheese (locally produced)	0.0016	0.017	0.18
Inhalation	0.026	0.11	0.42
Mother's milk (mother on Diet 1)	0.00045	0.012	0.32
Prenatal exposure (mother on Diet 1)	0.0041	0.036	0.39
Diet 1	1.4	7.7	47
Diet 2	0.51	3.1	21
Diet 3	0.22	1.3	9.3

Excess Lifetime Risk [ ]			
Diet 1	1.4E-05	5.7E-04	9.9E-03
Diet 2	7.7E-06	2.1E-04	4.7E-03
Diet 3	3.8E-06	8.5E-05	1.9E-03
Diet 4	3.9E-05	1.3E-03	2.7E-02

Relative Risk [ ]			
Diet 1	1.019	1.34	8.6
Diet 2	1.0075	1.14	4.1
Diet 3	1.003	1.057	2.4
Diet 4	1.04	1.88	21

Probability of Causation [%]			
Diet 1	1.91	25.6	88
Diet 2	0.75	12.5	75
Diet 3	0.30	5.4	58
Diet 4	3.86	46.7	95

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.26	1.6	11
Commercial Milk (locally produced)	0.073	0.56	4.4
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	0.46	4.2	40
Beef (locally produced)	0.00038	0.0072	0.17
Leafy Vegetables (locally produced)	0.0001	0.0012	0.011
Eggs (locally produced)	0.012	0.11	0.86
Cottage Cheese (locally produced)	0.00034	0.0041	0.05
Inhalation	0.0058	0.024	0.1
Mother's milk (mother on Diet 1)	0.000093	0.0029	0.082
Prenatal exposure (mother on Diet 1)	0.0009	0.0087	0.096
Diet 1	0.29	1.8	12
Diet 2	0.11	0.74	5.1
Diet 3	0.19	1.2	8

Excess Lifetime Risk [ ]			
Diet 1	3.0E-05	4.8E-04	7.4E-03
Diet 2	1.5E-05	1.8E-04	2.6E-03
Diet 3	2.6E-05	3.0E-04	4.0E-03
Diet 4	6.7E-05	1.2E-03	1.8E-02

Relative Risk [ ]			
Diet 1	1.01	1.12	2.3
Diet 2	1.0041	1.048	1.62
Diet 3	1.0077	1.079	2.1
Diet 4	1.024	1.28	5.4

Probability of Causation [%]			
Diet 1	1.04	10.8	56
Diet 2	0.41	4.6	37
Diet 3	0.76	7.3	51
Diet 4	2.29	21.4	81

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	1.7	11
Commercial Milk (locally produced)	0.075	0.55	4.4
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.44	4.5	35
Beef (locally produced)	0.00041	0.007	0.17
Leafy Vegetables (locally produced)	0.0001	0.0011	0.011
Eggs (locally produced)	0.013	0.11	0.84
Cottage Cheese (locally produced)	0.00035	0.0041	0.047
Inhalation	0.0057	0.024	0.1
Mother's milk (mother on Diet 1)	0.000093	0.0029	0.082
Prenatal exposure (mother on Diet 1)	0.0009	0.0087	0.096
Diet 1	0.31	1.8	12
Diet 2	0.11	0.72	5.4
Diet 3	0.18	1.2	9

Excess Lifetime Risk [ ]			
Diet 1	3.2E-06	1.3E-04	2.5E-03
Diet 2	1.8E-06	5.1E-05	1.1E-03
Diet 3	3.2E-06	7.9E-05	1.9E-03
Diet 4	9.1E-06	3.0E-04	6.6E-03

Relative Risk [ ]			
Diet 1	1.0044	1.082	2.8
Diet 2	1.0016	1.033	1.78
Diet 3	1.0027	1.054	2.3
Diet 4	1.01	1.21	5.6

Probability of Causation [%]			
Diet 1	0.44	7.5	63
Diet 2	0.16	3.2	43
Diet 3	0.27	5.2	57
Diet 4	1.03	17.3	81

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1	5.7	36
Commercial Milk (locally produced)	0.28	2	14
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	2	15	130
Beef (locally produced)	0.0013	0.025	0.65
Leafy Vegetables (locally produced)	0.0004	0.0042	0.038
Eggs (locally produced)	0.048	0.38	2.8
Cottage Cheese (locally produced)	0.0013	0.014	0.16
Inhalation	0.022	0.088	0.34
Mother's milk (mother on Diet 1)	0.00037	0.011	0.27
Prenatal exposure (mother on Diet 1)	0.0035	0.03	0.32
Diet 1	1.2	6.3	39
Diet 2	0.43	2.6	17
Diet 3	0.22	1.3	8.2

Excess Lifetime Risk [ ]			
Diet 1	1.1E-04	1.7E-03	2.6E-02
Diet 2	5.8E-05	6.6E-04	8.2E-03
Diet 3	2.9E-05	3.2E-04	4.1E-03
Diet 4	2.8E-04	4.4E-03	5.9E-02

Relative Risk [ ]			
Diet 1	1.041	1.45	5.2
Diet 2	1.016	1.17	3.1
Diet 3	1.0088	1.082	2.1
Diet 4	1.092	1.97	18

Probability of Causation [%]			
Diet 1	3.90	30.8	81
Diet 2	1.61	14.3	67
Diet 3	0.88	7.6	52
Diet 4	8.38	49.1	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	5.9	35
Commercial Milk (locally produced)	0.29	1.9	15
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	1.8	16	120
Beef (locally produced)	0.0014	0.025	0.61
Leafy Vegetables (locally produced)	0.00041	0.0042	0.035
Eggs (locally produced)	0.055	0.38	2.9
Cottage Cheese (locally produced)	0.0013	0.015	0.15
Inhalation	0.022	0.088	0.34
Mother's milk (mother on Diet 1)	0.00037	0.011	0.27
Prenatal exposure (mother on Diet 1)	0.0035	0.03	0.32
Diet 1	1.2	6.4	39
Diet 2	0.44	2.5	18
Diet 3	0.22	1.2	9.2

Excess Lifetime Risk [ ]			
Diet 1	1.2E-05	4.7E-04	8.2E-03
Diet 2	6.5E-06	1.7E-04	3.9E-03
Diet 3	3.7E-06	8.4E-05	1.9E-03
Diet 4	3.3E-05	1.1E-03	2.3E-02

Relative Risk [ ]			
Diet 1	1.016	1.29	7.2
Diet 2	1.0061	1.12	3.6
Diet 3	1.0029	1.057	2.4
Diet 4	1.033	1.75	17

Probability of Causation [%]			
Diet 1	1.54	22.3	86
Diet 2	0.61	10.7	72
Diet 3	0.29	5.4	58
Diet 4	3.17	42.6	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.49	2.8	17
Commercial Milk (locally produced)	0.13	0.95	7
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	0.89	7.5	65
Beef (locally produced)	0.00062	0.012	0.28
Leafy Vegetables (locally produced)	0.00019	0.002	0.019
Eggs (locally produced)	0.023	0.18	1.4
Cottage Cheese (locally produced)	0.00058	0.0071	0.077
Inhalation	0.0098	0.041	0.17
Mother's milk (mother on Diet 1)	0.00017	0.0049	0.13
Prenatal exposure (mother on Diet 1)	0.0015	0.015	0.15
Diet 1	0.56	3.1	18
Diet 2	0.19	1.2	8.4
Diet 3	0.19	1.2	8.1

Excess Lifetime Risk [ ]			
Diet 1	5.7E-05	8.2E-04	1.4E-02
Diet 2	2.8E-05	3.0E-04	4.6E-03
Diet 3	2.7E-05	3.1E-04	4.1E-03
Diet 4	1.3E-04	2.1E-03	3.0E-02

Relative Risk [ ]			
Diet 1	1.023	1.22	3.2
Diet 2	1.0077	1.082	2.1
Diet 3	1.008	1.08	2.1
Diet 4	1.046	1.47	8.5

Probability of Causation [%]			
Diet 1	2.22	17.6	68
Diet 2	0.76	7.5	51
Diet 3	0.79	7.4	52
Diet 4	4.38	31.7	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.49	2.9	16
Commercial Milk (locally produced)	0.14	0.91	6.6
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.82	7.8	58
Beef (locally produced)	0.00063	0.012	0.27
Leafy Vegetables (locally produced)	0.00019	0.002	0.018
Eggs (locally produced)	0.026	0.18	1.3
Cottage Cheese (locally produced)	0.00058	0.0071	0.069
Inhalation	0.01	0.042	0.17
Mother's milk (mother on Diet 1)	0.00017	0.0049	0.13
Prenatal exposure (mother on Diet 1)	0.0015	0.015	0.15
Diet 1	0.55	3.1	18
Diet 2	0.2	1.2	8.3
Diet 3	0.19	1.2	9

Excess Lifetime Risk [ ]			
Diet 1	6.4E-06	2.3E-04	3.6E-03
Diet 2	3.0E-06	8.3E-05	1.7E-03
Diet 3	3.4E-06	8.1E-05	1.9E-03
Diet 4	1.5E-05	5.0E-04	1.0E-02

Relative Risk [ ]			
Diet 1	1.0075	1.14	4.1
Diet 2	1.0029	1.055	2.2
Diet 3	1.0028	1.055	2.3
Diet 4	1.017	1.37	8.7

Probability of Causation [%]			
Diet 1	0.74	12.2	75
Diet 2	0.29	5.2	55
Diet 3	0.28	5.2	57
Diet 4	1.66	26.5	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.79	4.4	29
Commercial Milk (locally produced)	0.21	1.5	11
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	1.4	12	100
Beef (locally produced)	0.00099	0.019	0.46
Leafy Vegetables (locally produced)	0.00031	0.0032	0.029
Eggs (locally produced)	0.037	0.29	2.1
Cottage Cheese (locally produced)	0.00097	0.011	0.13
Inhalation	0.017	0.067	0.27
Mother's milk (mother on Diet 1)	0.00027	0.0078	0.21
Prenatal exposure (mother on Diet 1)	0.0026	0.023	0.25
Diet 1	0.89	4.8	32
Diet 2	0.33	2.1	13
Diet 3	0.21	1.3	8.2

Excess Lifetime Risk [ ]			
Diet 1	8.6E-05	1.3E-03	1.9E-02
Diet 2	4.4E-05	5.1E-04	6.3E-03
Diet 3	2.8E-05	3.1E-04	4.1E-03
Diet 4	2.0E-04	3.3E-03	4.5E-02

Relative Risk [ ]			
Diet 1	1.031	1.34	4.3
Diet 2	1.012	1.13	2.5
Diet 3	1.0084	1.081	2.1
Diet 4	1.069	1.75	14

Probability of Causation [%]			
Diet 1	3.03	25.0	76
Diet 2	1.22	11.4	59
Diet 3	0.84	7.5	52
Diet 4	6.41	42.3	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.84	4.5	28
Commercial Milk (locally produced)	0.22	1.5	11
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	1.3	12	90
Beef (locally produced)	0.0011	0.019	0.46
Leafy Vegetables (locally produced)	0.0003	0.0032	0.027
Eggs (locally produced)	0.04	0.29	2.2
Cottage Cheese (locally produced)	0.00099	0.011	0.12
Inhalation	0.016	0.067	0.27
Mother's milk (mother on Diet 1)	0.00027	0.0078	0.21
Prenatal exposure (mother on Diet 1)	0.0026	0.023	0.25
Diet 1	0.95	5	30
Diet 2	0.32	2	14
Diet 3	0.21	1.2	9.1

Excess Lifetime Risk [ ]			
Diet 1	8.9E-06	3.7E-04	6.4E-03
Diet 2	4.9E-06	1.4E-04	3.1E-03
Diet 3	3.6E-06	8.3E-05	1.9E-03
Diet 4	2.5E-05	8.1E-04	1.7E-02

Relative Risk [ ]			
Diet 1	1.013	1.22	5.8
Diet 2	1.0045	1.091	3
Diet 3	1.0029	1.056	2.4
Diet 4	1.028	1.56	13

Probability of Causation [%]			
Diet 1	1.27	18.1	82
Diet 2	0.45	8.3	66
Diet 3	0.29	5.3	58
Diet 4	2.69	35.6	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.44	2.5	16
Commercial Milk (locally produced)	0.11	0.88	5.6
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	0.77	6.9	64
Beef (locally produced)	0.00065	0.011	0.28
Leafy Vegetables (locally produced)	0.00017	0.0018	0.018
Eggs (locally produced)	0.021	0.17	1.4
Cottage Cheese (locally produced)	0.0005	0.0065	0.073
Inhalation	0.01	0.046	0.21
Mother's milk (mother on Diet 1)	0.00018	0.0047	0.12
Prenatal exposure (mother on Diet 1)	0.0014	0.014	0.14
Diet 1	0.48	2.8	18
Diet 2	0.17	1.2	7.1
Diet 3	0.19	1.2	8.1

Excess Lifetime Risk [ ]			
Diet 1	5.6E-05	7.6E-04	1.3E-02
Diet 2	2.4E-05	3.0E-04	3.8E-03
Diet 3	2.7E-05	3.1E-04	4.1E-03
Diet 4	1.2E-04	1.9E-03	2.7E-02

Relative Risk [ ]			
Diet 1	1.019	1.2	3.1
Diet 2	1.0073	1.075	1.94
Diet 3	1.0081	1.08	2.1
Diet 4	1.039	1.44	8

Probability of Causation [%]			
Diet 1	1.86	16.6	67
Diet 2	0.72	7.0	48
Diet 3	0.81	7.4	52
Diet 4	3.72	30.4	87

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.42	2.6	17
Commercial Milk (locally produced)	0.12	0.87	5.8
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.76	7.2	62
Beef (locally produced)	0.00063	0.011	0.27
Leafy Vegetables (locally produced)	0.00016	0.0019	0.018
Eggs (locally produced)	0.023	0.17	1.2
Cottage Cheese (locally produced)	0.00054	0.0066	0.065
Inhalation	0.01	0.047	0.18
Mother's milk (mother on Diet 1)	0.00018	0.0047	0.12
Prenatal exposure (mother on Diet 1)	0.0014	0.014	0.14
Diet 1	0.48	2.9	18
Diet 2	0.18	1.1	7.5
Diet 3	0.2	1.2	9

Excess Lifetime Risk [ ]			
Diet 1	6.0E-06	2.0E-04	3.6E-03
Diet 2	2.8E-06	7.6E-05	1.7E-03
Diet 3	3.4E-06	8.1E-05	1.9E-03
Diet 4	1.5E-05	4.7E-04	8.7E-03

Relative Risk [ ]			
Diet 1	1.0075	1.14	4
Diet 2	1.0027	1.053	2.2
Diet 3	1.0028	1.056	2.3
Diet 4	1.014	1.34	8.5

Probability of Causation [%]			
Diet 1	0.74	12.3	75
Diet 2	0.27	5.1	54
Diet 3	0.28	5.3	57
Diet 4	1.34	25.3	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.11	0.73	4.6
Commercial Milk (locally produced)	0.032	0.24	1.9
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	0.23	1.9	18
Beef (locally produced)	0.00017	0.0029	0.078
Leafy Vegetables (locally produced)	0.000042	0.00049	0.0053
Eggs (locally produced)	0.0052	0.046	0.37
Cottage Cheese (locally produced)	0.00015	0.0018	0.021
Inhalation	0.0024	0.011	0.051
Mother's milk (mother on Diet 1)	0.000042	0.0012	0.038
Prenatal exposure (mother on Diet 1)	0.00037	0.0035	0.04
Diet 1	0.13	0.79	5
Diet 2	0.05	0.31	2.3
Diet 3	0.18	1.2	7.9

Excess Lifetime Risk [ ]			
Diet 1	1.1E-05	2.1E-04	3.4E-03
Diet 2	6.5E-06	7.9E-05	1.1E-03
Diet 3	2.6E-05	2.9E-04	4.0E-03
Diet 4	3.0E-05	5.0E-04	7.7E-03

Relative Risk [ ]			
Diet 1	1.0052	1.051	1.61
Diet 2	1.0019	1.02	1.31
Diet 3	1.0074	1.078	2.1
Diet 4	1.011	1.13	3.2

Probability of Causation [%]			
Diet 1	0.52	4.9	38
Diet 2	0.19	1.9	24
Diet 3	0.74	7.2	51
Diet 4	1.07	11.2	68

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.11	0.7	4.7
Commercial Milk (locally produced)	0.035	0.23	1.9
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.2	1.9	17
Beef (locally produced)	0.00017	0.0029	0.077
Leafy Vegetables (locally produced)	0.000042	0.0005	0.0051
Eggs (locally produced)	0.0055	0.046	0.34
Cottage Cheese (locally produced)	0.00013	0.0018	0.018
Inhalation	0.0025	0.011	0.046
Mother's milk (mother on Diet 1)	0.000042	0.0012	0.038
Prenatal exposure (mother on Diet 1)	0.00037	0.0035	0.04
Diet 1	0.12	0.78	5.1
Diet 2	0.052	0.31	2.4
Diet 3	0.18	1.1	8.9

Excess Lifetime Risk [ ]			
Diet 1	1.3E-06	5.6E-05	1.1E-03
Diet 2	7.2E-07	2.2E-05	4.2E-04
Diet 3	3.1E-06	7.8E-05	1.9E-03
Diet 4	4.4E-06	1.3E-04	3.4E-03

Relative Risk [ ]			
Diet 1	1.0015	1.036	1.77
Diet 2	1.00063	1.014	1.35
Diet 3	1.0027	1.054	2.3
Diet 4	1.0031	1.09	3.2

Probability of Causation [%]			
Diet 1	0.15	3.5	43
Diet 2	0.06	1.3	26
Diet 3	0.27	5.1	56
Diet 4	0.31	8.2	68

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.48	2.9	19
Commercial Milk (locally produced)	0.15	1	7.2
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	0.95	7.8	72
Beef (locally produced)	0.00072	0.013	0.29
Leafy Vegetables (locally produced)	0.0002	0.002	0.02
Eggs (locally produced)	0.023	0.19	1.4
Cottage Cheese (locally produced)	0.00064	0.0073	0.084
Inhalation	0.012	0.048	0.2
Mother's milk (mother on Diet 1)	0.0002	0.0053	0.14
Prenatal exposure (mother on Diet 1)	0.0016	0.016	0.16
Diet 1	0.54	3.2	20
Diet 2	0.22	1.3	9.2
Diet 3	0.2	1.2	8.1

Excess Lifetime Risk [ ]			
Diet 1	5.2E-05	8.7E-04	1.3E-02
Diet 2	2.9E-05	3.4E-04	4.5E-03
Diet 3	2.8E-05	3.1E-04	4.1E-03
Diet 4	1.3E-04	2.2E-03	3.0E-02

Relative Risk [ ]			
Diet 1	1.021	1.22	3.2
Diet 2	1.0081	1.084	2
Diet 3	1.0081	1.08	2.1
Diet 4	1.044	1.49	9.3

Probability of Causation [%]			
Diet 1	2.07	17.7	67
Diet 2	0.80	7.7	49
Diet 3	0.81	7.4	52
Diet 4	4.21	32.1	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.5	2.9	18
Commercial Milk (locally produced)	0.15	0.97	7.4
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.91	8.1	61
Beef (locally produced)	0.00073	0.012	0.32
Leafy Vegetables (locally produced)	0.00019	0.0021	0.019
Eggs (locally produced)	0.026	0.19	1.4
Cottage Cheese (locally produced)	0.00064	0.0072	0.074
Inhalation	0.011	0.047	0.19
Mother's milk (mother on Diet 1)	0.0002	0.0053	0.14
Prenatal exposure (mother on Diet 1)	0.0016	0.016	0.16
Diet 1	0.57	3.3	20
Diet 2	0.22	1.3	9
Diet 3	0.2	1.2	9

Excess Lifetime Risk [ ]			
Diet 1	6.8E-06	2.2E-04	4.1E-03
Diet 2	3.4E-06	8.6E-05	1.8E-03
Diet 3	3.5E-06	8.1E-05	1.9E-03
Diet 4	1.8E-05	5.3E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.0077	1.15	4.3
Diet 2	1.003	1.058	2.4
Diet 3	1.0028	1.056	2.3
Diet 4	1.016	1.38	10

Probability of Causation [%]			
Diet 1	0.76	12.7	75
Diet 2	0.30	5.4	57
Diet 3	0.28	5.3	57
Diet 4	1.59	27.1	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.47	2.7	16
Commercial Milk (locally produced)	0.13	0.93	6.4
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	0.84	7.2	64
Beef (locally produced)	0.00065	0.011	0.26
Leafy Vegetables (locally produced)	0.00019	0.0019	0.018
Eggs (locally produced)	0.022	0.17	1.4
Cottage Cheese (locally produced)	0.00057	0.0069	0.073
Inhalation	0.011	0.047	0.2
Mother's milk (mother on Diet 1)	0.00018	0.0049	0.13
Prenatal exposure (mother on Diet 1)	0.0015	0.014	0.15
Diet 1	0.52	3	17
Diet 2	0.2	1.2	7.9
Diet 3	0.19	1.2	8.1

Excess Lifetime Risk [ ]			
Diet 1	5.2E-05	7.9E-04	1.2E-02
Diet 2	2.7E-05	3.1E-04	4.4E-03
Diet 3	2.7E-05	3.1E-04	4.1E-03
Diet 4	1.2E-04	2.0E-03	2.9E-02

Relative Risk [ ]			
Diet 1	1.022	1.2	3.2
Diet 2	1.0074	1.078	1.98
Diet 3	1.0082	1.08	2.1
Diet 4	1.042	1.46	8.1

Probability of Causation [%]			
Diet 1	2.11	16.9	68
Diet 2	0.74	7.3	49
Diet 3	0.81	7.4	52
Diet 4	4.06	31.5	87

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.47	2.8	16
Commercial Milk (locally produced)	0.14	0.9	6.4
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.79	7.5	59
Beef (locally produced)	0.00063	0.011	0.27
Leafy Vegetables (locally produced)	0.00018	0.0019	0.018
Eggs (locally produced)	0.025	0.17	1.2
Cottage Cheese (locally produced)	0.00056	0.007	0.064
Inhalation	0.011	0.047	0.2
Mother's milk (mother on Diet 1)	0.00018	0.0049	0.13
Prenatal exposure (mother on Diet 1)	0.0015	0.014	0.15
Diet 1	0.53	3.1	18
Diet 2	0.21	1.2	8.2
Diet 3	0.2	1.2	9

Excess Lifetime Risk [ ]			
Diet 1	5.9E-06	2.2E-04	3.5E-03
Diet 2	2.8E-06	8.1E-05	1.6E-03
Diet 3	3.5E-06	8.1E-05	1.9E-03
Diet 4	1.5E-05	4.9E-04	9.9E-03

Relative Risk [ ]			
Diet 1	1.0069	1.14	3.8
Diet 2	1.0028	1.053	2.2
Diet 3	1.0028	1.056	2.3
Diet 4	1.014	1.35	8.5

Probability of Causation [%]			
Diet 1	0.69	12.2	74
Diet 2	0.28	5.0	55
Diet 3	0.28	5.3	57
Diet 4	1.41	25.9	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.51	3	19
Commercial Milk (locally produced)	0.14	1	7.6
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	0.95	8.3	71
Beef (locally produced)	0.00076	0.013	0.3
Leafy Vegetables (locally produced)	0.00021	0.0022	0.02
Eggs (locally produced)	0.024	0.2	1.6
Cottage Cheese (locally produced)	0.00062	0.0077	0.082
Inhalation	0.013	0.055	0.24
Mother's milk (mother on Diet 1)	0.00022	0.0056	0.15
Prenatal exposure (mother on Diet 1)	0.0017	0.016	0.17
Diet 1	0.57	3.4	21
Diet 2	0.23	1.4	9.2
Diet 3	0.2	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	5.6E-05	9.3E-04	1.4E-02
Diet 2	3.0E-05	3.6E-04	4.5E-03
Diet 3	2.8E-05	3.1E-04	4.1E-03
Diet 4	1.4E-04	2.3E-03	3.0E-02

Relative Risk [ ]			
Diet 1	1.022	1.23	3.2
Diet 2	1.0083	1.089	1.98
Diet 3	1.0083	1.08	2.1
Diet 4	1.048	1.52	9.3

Probability of Causation [%]			
Diet 1	2.18	18.8	69
Diet 2	0.82	8.1	49
Diet 3	0.82	7.4	52
Diet 4	4.61	34.4	89

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.5	3.1	19
Commercial Milk (locally produced)	0.15	1	7.6
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.93	8.4	68
Beef (locally produced)	0.00077	0.013	0.3
Leafy Vegetables (locally produced)	0.0002	0.0021	0.02
Eggs (locally produced)	0.028	0.2	1.5
Cottage Cheese (locally produced)	0.00062	0.0077	0.076
Inhalation	0.013	0.056	0.23
Mother's milk (mother on Diet 1)	0.00022	0.0056	0.15
Prenatal exposure (mother on Diet 1)	0.0017	0.016	0.17
Diet 1	0.57	3.4	20
Diet 2	0.23	1.4	9.2
Diet 3	0.2	1.2	9.1

Excess Lifetime Risk [ ]			
Diet 1	6.9E-06	2.5E-04	4.2E-03
Diet 2	3.4E-06	9.1E-05	1.8E-03
Diet 3	3.6E-06	8.2E-05	1.9E-03
Diet 4	1.9E-05	5.6E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.0079	1.16	4.4
Diet 2	1.0031	1.062	2.5
Diet 3	1.0028	1.056	2.4
Diet 4	1.017	1.4	12

Probability of Causation [%]			
Diet 1	0.78	13.7	77
Diet 2	0.31	5.9	59
Diet 3	0.28	5.3	57
Diet 4	1.68	28.4	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.3	1.7	13
Commercial Milk (locally produced)	0.069	0.56	4.4
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	0.48	4.3	42
Beef (locally produced)	0.0004	0.0072	0.18
Leafy Vegetables (locally produced)	0.00011	0.0012	0.011
Eggs (locally produced)	0.014	0.11	0.88
Cottage Cheese (locally produced)	0.00034	0.0041	0.061
Inhalation	0.0074	0.032	0.13
Mother's milk (mother on Diet 1)	0.00013	0.003	0.09
Prenatal exposure (mother on Diet 1)	0.001	0.0092	0.096
Diet 1	0.34	1.9	14
Diet 2	0.12	0.77	5.2
Diet 3	0.19	1.2	8

Excess Lifetime Risk [ ]			
Diet 1	2.8E-05	4.8E-04	7.1E-03
Diet 2	1.5E-05	1.9E-04	2.8E-03
Diet 3	2.7E-05	3.0E-04	4.1E-03
Diet 4	7.9E-05	1.2E-03	2.3E-02

Relative Risk [ ]			
Diet 1	1.012	1.12	2.4
Diet 2	1.0048	1.048	1.62
Diet 3	1.0078	1.079	2.1
Diet 4	1.027	1.28	6

Probability of Causation [%]			
Diet 1	1.14	11.1	59
Diet 2	0.48	4.6	38
Diet 3	0.77	7.3	52
Diet 4	2.61	22.0	83

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.29	1.7	13
Commercial Milk (locally produced)	0.074	0.54	4.3
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.46	4.7	40
Beef (locally produced)	0.00041	0.0075	0.17
Leafy Vegetables (locally produced)	0.00012	0.0012	0.011
Eggs (locally produced)	0.015	0.11	0.84
Cottage Cheese (locally produced)	0.00034	0.0041	0.051
Inhalation	0.0079	0.031	0.14
Mother's milk (mother on Diet 1)	0.00013	0.003	0.09
Prenatal exposure (mother on Diet 1)	0.001	0.0092	0.096
Diet 1	0.35	1.9	14
Diet 2	0.13	0.75	5
Diet 3	0.19	1.2	9

Excess Lifetime Risk [ ]			
Diet 1	4.1E-06	1.3E-04	2.5E-03
Diet 2	1.8E-06	4.8E-05	9.9E-04
Diet 3	3.4E-06	8.0E-05	1.9E-03
Diet 4	1.0E-05	2.9E-04	7.3E-03

Relative Risk [ ]			
Diet 1	1.0044	1.086	2.9
Diet 2	1.0016	1.034	1.83
Diet 3	1.0028	1.055	2.3
Diet 4	1.0088	1.23	5.8

Probability of Causation [%]			
Diet 1	0.44	8.0	65
Diet 2	0.16	3.3	45
Diet 3	0.28	5.2	57
Diet 4	0.87	18.4	82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.48	2.6	17
Commercial Milk (locally produced)	0.12	0.9	6.1
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	0.86	6.8	60
Beef (locally produced)	0.00061	0.011	0.27
Leafy Vegetables (locally produced)	0.00018	0.0019	0.017
Eggs (locally produced)	0.021	0.17	1.3
Cottage Cheese (locally produced)	0.00058	0.0064	0.082
Inhalation	0.012	0.047	0.2
Mother's milk (mother on Diet 1)	0.00017	0.0048	0.13
Prenatal exposure (mother on Diet 1)	0.0016	0.014	0.15
Diet 1	0.53	2.9	19
Diet 2	0.2	1.2	7.7
Diet 3	0.2	1.2	8.1

Excess Lifetime Risk [ ]			
Diet 1	5.0E-05	7.9E-04	1.1E-02
Diet 2	2.7E-05	3.0E-04	3.8E-03
Diet 3	2.8E-05	3.1E-04	4.1E-03
Diet 4	1.2E-04	2.0E-03	2.9E-02

Relative Risk [ ]			
Diet 1	1.018	1.19	3
Diet 2	1.0072	1.077	1.89
Diet 3	1.0081	1.08	2.1
Diet 4	1.04	1.44	8.1

Probability of Causation [%]			
Diet 1	1.78	16.2	67
Diet 2	0.71	7.2	47
Diet 3	0.80	7.4	52
Diet 4	3.85	30.4	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**  
**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.48	2.7	17
Commercial Milk (locally produced)	0.13	0.88	6.5
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.78	7.3	57
Beef (locally produced)	0.00063	0.011	0.27
Leafy Vegetables (locally produced)	0.00017	0.0019	0.016
Eggs (locally produced)	0.024	0.17	1.2
Cottage Cheese (locally produced)	0.00056	0.0065	0.072
Inhalation	0.012	0.047	0.19
Mother's milk (mother on Diet 1)	0.00017	0.0048	0.13
Prenatal exposure (mother on Diet 1)	0.0016	0.014	0.15
Diet 1	0.55	2.9	19
Diet 2	0.21	1.2	8
Diet 3	0.2	1.2	9.1

Excess Lifetime Risk [ ]			
Diet 1	5.9E-06	2.1E-04	3.8E-03
Diet 2	3.1E-06	7.8E-05	1.7E-03
Diet 3	3.5E-06	8.1E-05	1.9E-03
Diet 4	1.6E-05	4.7E-04	1.0E-02

Relative Risk [ ]			
Diet 1	1.007	1.14	3.8
Diet 2	1.0025	1.054	2.3
Diet 3	1.0028	1.056	2.3
Diet 4	1.014	1.35	8.1

Probability of Causation [%]			
Diet 1	0.69	12.0	73
Diet 2	0.25	5.1	55
Diet 3	0.28	5.3	57
Diet 4	1.42	25.7	87

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.29	1.6	9.3
Commercial Milk (locally produced)	0.082	0.56	3.9
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	0.55	4.4	36
Beef (locally produced)	0.00038	0.007	0.18
Leafy Vegetables (locally produced)	0.00011	0.0012	0.011
Eggs (locally produced)	0.013	0.1	0.78
Cottage Cheese (locally produced)	0.00038	0.004	0.045
Inhalation	0.0061	0.026	0.11
Mother's milk (mother on Diet 1)	0.00011	0.0029	0.079
Prenatal exposure (mother on Diet 1)	0.0009	0.0084	0.085
Diet 1	0.33	1.8	10
Diet 2	0.13	0.73	4.9
Diet 3	0.19	1.2	8

Excess Lifetime Risk [ ]			
Diet 1	3.0E-05	4.8E-04	7.3E-03
Diet 2	1.6E-05	1.8E-04	2.5E-03
Diet 3	2.6E-05	3.0E-04	4.0E-03
Diet 4	7.8E-05	1.2E-03	1.6E-02

Relative Risk [ ]			
Diet 1	1.012	1.12	2.2
Diet 2	1.0045	1.047	1.62
Diet 3	1.0077	1.079	2.1
Diet 4	1.026	1.28	5.6

Probability of Causation [%]			
Diet 1	1.22	10.8	54
Diet 2	0.45	4.5	38
Diet 3	0.77	7.3	51
Diet 4	2.50	21.6	82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**  
**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.3	1.6	9.1
Commercial Milk (locally produced)	0.087	0.55	4.1
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.5	4.5	36
Beef (locally produced)	0.00038	0.0068	0.17
Leafy Vegetables (locally produced)	0.00011	0.0012	0.011
Eggs (locally produced)	0.015	0.1	0.73
Cottage Cheese (locally produced)	0.00035	0.0041	0.04
Inhalation	0.0065	0.026	0.1
Mother's milk (mother on Diet 1)	0.00011	0.0029	0.079
Prenatal exposure (mother on Diet 1)	0.0009	0.0084	0.085
Diet 1	0.34	1.8	10
Diet 2	0.13	0.73	5.2
Diet 3	0.18	1.2	9

Excess Lifetime Risk [ ]			
Diet 1	3.4E-06	1.3E-04	2.3E-03
Diet 2	1.9E-06	5.1E-05	1.0E-03
Diet 3	3.3E-06	8.0E-05	1.9E-03
Diet 4	9.9E-06	3.0E-04	6.2E-03

Relative Risk [ ]			
Diet 1	1.0041	1.083	2.6
Diet 2	1.0017	1.032	1.7
Diet 3	1.0027	1.055	2.3
Diet 4	1.0085	1.21	5.4

Probability of Causation [%]			
Diet 1	0.41	7.6	61
Diet 2	0.17	3.1	41
Diet 3	0.27	5.2	57
Diet 4	0.84	17.0	81

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.33	2	11
Commercial Milk (locally produced)	0.091	0.69	4.6
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	0.56	5.3	49
Beef (locally produced)	0.00048	0.0082	0.19
Leafy Vegetables (locally produced)	0.00015	0.0014	0.014
Eggs (locally produced)	0.016	0.12	0.97
Cottage Cheese (locally produced)	0.00039	0.0053	0.055
Inhalation	0.0084	0.037	0.15
Mother's milk (mother on Diet 1)	0.00013	0.0035	0.095
Prenatal exposure (mother on Diet 1)	0.001	0.011	0.11
Diet 1	0.38	2.2	12
Diet 2	0.13	0.91	5.6
Diet 3	0.19	1.2	8

Excess Lifetime Risk [ ]			
Diet 1	4.0E-05	5.8E-04	9.7E-03
Diet 2	1.8E-05	2.3E-04	3.3E-03
Diet 3	2.7E-05	3.0E-04	4.1E-03
Diet 4	9.1E-05	1.5E-03	2.3E-02

Relative Risk [ ]			
Diet 1	1.017	1.15	2.5
Diet 2	1.0057	1.06	1.72
Diet 3	1.0079	1.08	2.1
Diet 4	1.03	1.34	6.2

Probability of Causation [%]			
Diet 1	1.70	13.1	61
Diet 2	0.57	5.7	42
Diet 3	0.79	7.4	52
Diet 4	2.92	25.3	84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.33	2	12
Commercial Milk (locally produced)	0.1	0.68	4.4
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.56	5.5	44
Beef (locally produced)	0.00048	0.0084	0.18
Leafy Vegetables (locally produced)	0.00014	0.0014	0.014
Eggs (locally produced)	0.018	0.12	0.9
Cottage Cheese (locally produced)	0.00043	0.0052	0.05
Inhalation	0.0086	0.038	0.16
Mother's milk (mother on Diet 1)	0.00013	0.0035	0.095
Prenatal exposure (mother on Diet 1)	0.001	0.011	0.11
Diet 1	0.38	2.3	12
Diet 2	0.15	0.9	5.8
Diet 3	0.19	1.2	9

Excess Lifetime Risk [ ]			
Diet 1	4.8E-06	1.6E-04	2.6E-03
Diet 2	2.1E-06	5.9E-05	1.2E-03
Diet 3	3.4E-06	8.1E-05	1.9E-03
Diet 4	1.0E-05	3.6E-04	6.8E-03

Relative Risk [ ]			
Diet 1	1.005	1.11	3.2
Diet 2	1.002	1.041	1.89
Diet 3	1.0028	1.055	2.3
Diet 4	1.0098	1.26	6.5

Probability of Causation [%]			
Diet 1	0.50	9.6	68
Diet 2	0.20	3.9	47
Diet 3	0.28	5.2	57
Diet 4	0.97	20.9	85

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.57	3.3	20
Commercial Milk (locally produced)	0.16	1.2	7.9
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	1.1	8.8	79
Beef (locally produced)	0.00077	0.014	0.33
Leafy Vegetables (locally produced)	0.00024	0.0024	0.022
Eggs (locally produced)	0.026	0.21	1.6
Cottage Cheese (locally produced)	0.00074	0.008	0.1
Inhalation	0.015	0.059	0.25
Mother's milk (mother on Diet 1)	0.0002	0.006	0.15
Prenatal exposure (mother on Diet 1)	0.002	0.018	0.19
Diet 1	0.64	3.7	23
Diet 2	0.24	1.5	10
Diet 3	0.21	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	6.4E-05	9.8E-04	1.4E-02
Diet 2	3.1E-05	3.9E-04	4.8E-03
Diet 3	2.8E-05	3.1E-04	4.1E-03
Diet 4	1.6E-04	2.5E-03	3.4E-02

Relative Risk [ ]			
Diet 1	1.025	1.25	3.5
Diet 2	1.0096	1.097	2.1
Diet 3	1.0083	1.081	2.1
Diet 4	1.051	1.57	9.8

Probability of Causation [%]			
Diet 1	2.45	20.2	71
Diet 2	0.96	8.8	53
Diet 3	0.83	7.5	52
Diet 4	4.85	36.1	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.58	3.4	20
Commercial Milk (locally produced)	0.17	1.1	8.4
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	1.1	9.2	72
Beef (locally produced)	0.00082	0.014	0.32
Leafy Vegetables (locally produced)	0.00023	0.0024	0.022
Eggs (locally produced)	0.029	0.22	1.5
Cottage Cheese (locally produced)	0.00077	0.0083	0.085
Inhalation	0.015	0.059	0.24
Mother's milk (mother on Diet 1)	0.0002	0.006	0.15
Prenatal exposure (mother on Diet 1)	0.002	0.018	0.19
Diet 1	0.65	3.7	22
Diet 2	0.25	1.5	10
Diet 3	0.21	1.2	9.1

Excess Lifetime Risk [ ]			
Diet 1	6.8E-06	2.7E-04	4.5E-03
Diet 2	3.9E-06	1.0E-04	2.2E-03
Diet 3	3.6E-06	8.2E-05	1.9E-03
Diet 4	1.9E-05	6.1E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.0095	1.17	4.4
Diet 2	1.0033	1.068	2.6
Diet 3	1.0028	1.056	2.4
Diet 4	1.018	1.43	10.1

Probability of Causation [%]			
Diet 1	0.94	14.6	77
Diet 2	0.33	6.3	61
Diet 3	0.28	5.3	58
Diet 4	1.78	30.3	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	1.6	11
Commercial Milk (locally produced)	0.072	0.54	4.3
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	0.5	4.4	38
Beef (locally produced)	0.00043	0.0072	0.16
Leafy Vegetables (locally produced)	0.00011	0.0012	0.01
Eggs (locally produced)	0.013	0.11	0.84
Cottage Cheese (locally produced)	0.00032	0.004	0.045
Inhalation	0.0074	0.031	0.15
Mother's milk (mother on Diet 1)	0.00012	0.0031	0.084
Prenatal exposure (mother on Diet 1)	0.0009	0.0088	0.091
Diet 1	0.31	1.8	12
Diet 2	0.12	0.74	5
Diet 3	0.19	1.2	8

Excess Lifetime Risk [ ]			
Diet 1	2.8E-05	5.0E-04	8.8E-03
Diet 2	1.5E-05	1.9E-04	2.6E-03
Diet 3	2.7E-05	3.0E-04	4.0E-03
Diet 4	7.0E-05	1.2E-03	1.7E-02

Relative Risk [ ]			
Diet 1	1.012	1.12	2.1
Diet 2	1.0046	1.048	1.56
Diet 3	1.0078	1.079	2.1
Diet 4	1.024	1.28	5.2

Probability of Causation [%]			
Diet 1	1.18	10.5	52
Diet 2	0.46	4.6	36
Diet 3	0.77	7.3	52
Diet 4	2.37	21.6	80

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	1.6	11
Commercial Milk (locally produced)	0.081	0.54	4.2
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.48	4.4	38
Beef (locally produced)	0.00043	0.007	0.16
Leafy Vegetables (locally produced)	0.00011	0.0011	0.01
Eggs (locally produced)	0.015	0.11	0.75
Cottage Cheese (locally produced)	0.00032	0.004	0.041
Inhalation	0.0074	0.032	0.14
Mother's milk (mother on Diet 1)	0.00012	0.0031	0.084
Prenatal exposure (mother on Diet 1)	0.0009	0.0088	0.091
Diet 1	0.31	1.8	12
Diet 2	0.12	0.73	5
Diet 3	0.19	1.2	9

Excess Lifetime Risk [ ]			
Diet 1	3.7E-06	1.3E-04	2.3E-03
Diet 2	2.0E-06	4.8E-05	1.1E-03
Diet 3	3.3E-06	7.9E-05	1.9E-03
Diet 4	9.8E-06	3.0E-04	7.2E-03

Relative Risk [ ]			
Diet 1	1.0042	1.086	2.7
Diet 2	1.0016	1.034	1.74
Diet 3	1.0028	1.055	2.3
Diet 4	1.0098	1.21	7.5

Probability of Causation [%]			
Diet 1	0.41	7.9	63
Diet 2	0.16	3.2	43
Diet 3	0.28	5.2	57
Diet 4	0.97	17.4	86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**  
**Receptor: Female born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.54	3	19
Commercial Milk (locally produced)	0.15	1	6.9
Commercial Milk (regionally mixed)	0.17	1.2	7.9
Goat Milk (locally produced)	1	8	69
Beef (locally produced)	0.00071	0.013	0.33
Leafy Vegetables (locally produced)	0.00021	0.0022	0.019
Eggs (locally produced)	0.024	0.2	1.5
Cottage Cheese (locally produced)	0.00068	0.0073	0.09
Inhalation	0.013	0.051	0.21
Mother's milk (mother on Diet 1)	0.00019	0.0055	0.14
Prenatal exposure (mother on Diet 1)	0.0019	0.016	0.17
Diet 1	0.61	3.3	21
Diet 2	0.23	1.4	9
Diet 3	0.2	1.2	8.1

Excess Lifetime Risk [ ]			
Diet 1	6.0E-05	9.1E-04	1.3E-02
Diet 2	3.2E-05	3.5E-04	4.2E-03
Diet 3	2.8E-05	3.1E-04	4.1E-03
Diet 4	1.4E-04	2.3E-03	3.2E-02

Relative Risk [ ]			
Diet 1	1.021	1.23	3.3
Diet 2	1.0087	1.089	2
Diet 3	1.0082	1.08	2.1
Diet 4	1.048	1.5	9.2

Probability of Causation [%]			
Diet 1	2.03	18.6	69
Diet 2	0.86	8.2	51
Diet 3	0.82	7.4	52
Diet 4	4.54	33.3	89

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**

**Receptor: Male born in 1950**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.54	3.1	19
Commercial Milk (locally produced)	0.16	1	7.6
Commercial Milk (regionally mixed)	0.17	1.1	8.9
Goat Milk (locally produced)	0.97	8.4	67
Beef (locally produced)	0.00075	0.013	0.31
Leafy Vegetables (locally produced)	0.00021	0.0022	0.019
Eggs (locally produced)	0.029	0.2	1.4
Cottage Cheese (locally produced)	0.00066	0.0075	0.079
Inhalation	0.013	0.051	0.2
Mother's milk (mother on Diet 1)	0.00019	0.0055	0.14
Prenatal exposure (mother on Diet 1)	0.0019	0.016	0.17
Diet 1	0.62	3.4	21
Diet 2	0.24	1.4	9.5
Diet 3	0.2	1.2	9.1

Excess Lifetime Risk [ ]			
Diet 1	6.8E-06	2.4E-04	4.3E-03
Diet 2	3.6E-06	9.0E-05	2.0E-03
Diet 3	3.6E-06	8.2E-05	1.9E-03
Diet 4	1.8E-05	5.5E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.0079	1.16	4.2
Diet 2	1.003	1.063	2.4
Diet 3	1.0028	1.056	2.3
Diet 4	1.016	1.4	9

Probability of Causation [%]			
Diet 1	0.78	13.5	76
Diet 2	0.30	5.9	58
Diet 3	0.28	5.3	57
Diet 4	1.62	28.5	89

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	4.4	28	200
Commercial Milk (locally produced)	1.2	9.2	65
Commercial Milk (regionally mixed)	0.18	1.3	8
Goat Milk (locally produced)	8.9	75	650
Beef (locally produced)	0.0061	0.1	2.5
Leafy Vegetables (locally produced)	0.001	0.013	0.13
Eggs (locally produced)	0.2	1.7	13
Cottage Cheese (locally produced)	0.0051	0.071	0.82
Inhalation	0.058	0.24	0.96
Mother's milk (mother on Diet 1)	0.0011	0.026	0.54
Prenatal exposure (mother on Diet 1)	0.011	0.075	0.82
Diet 1	4.9	30	220
Diet 2	1.8	12	78
Diet 3	0.29	1.5	8.7

Excess Lifetime Risk [ ]			
Diet 1	6.0E-04	9.3E-03	1.4E-01
Diet 2	2.6E-04	3.5E-03	4.5E-02
Diet 3	4.2E-05	4.5E-04	5.0E-03
Diet 4	1.3E-03	2.5E-02	3.6E-01

Relative Risk [ ]			
Diet 1	1.24	3.2	29
Diet 2	1.086	1.87	13
Diet 3	1.013	1.11	2.3
Diet 4	1.52	6.4	93

Probability of Causation [%]			
Diet 1	19.01	68.8	97
Diet 2	7.89	46.2	92
Diet 3	1.30	9.9	57
Diet 4	34.35	84.2	99

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**  
**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	4.4	27	190
Commercial Milk (locally produced)	1.2	9	68
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	9.4	73	650
Beef (locally produced)	0.006	0.1	2.3
Leafy Vegetables (locally produced)	0.0011	0.013	0.12
Eggs (locally produced)	0.24	1.7	13
Cottage Cheese (locally produced)	0.0053	0.069	0.85
Inhalation	0.057	0.24	0.93
Mother's milk (mother on Diet 1)	0.0011	0.026	0.54
Prenatal exposure (mother on Diet 1)	0.011	0.075	0.82
Diet 1	4.8	29	210
Diet 2	1.7	12	82
Diet 3	0.28	1.5	9.7

Excess Lifetime Risk [ ]			
Diet 1	7.9E-05	2.4E-03	4.7E-02
Diet 2	3.7E-05	8.9E-04	2.0E-02
Diet 3	5.4E-06	1.2E-04	2.2E-03
Diet 4	1.8E-04	5.8E-03	1.3E-01

Relative Risk [ ]			
Diet 1	1.1	2.6	41
Diet 2	1.033	1.62	18
Diet 3	1.0048	1.079	2.9
Diet 4	1.2	5.5	101

Probability of Causation [%]			
Diet 1	9.12	61.2	98
Diet 2	3.16	38.2	94
Diet 3	0.47	7.3	66
Diet 4	16.70	81.6	99

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	5.5	35	230
Commercial Milk (locally produced)	1.6	11	84
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	10	88	760
Beef (locally produced)	0.007	0.13	2.9
Leafy Vegetables (locally produced)	0.0013	0.016	0.15
Eggs (locally produced)	0.25	2	16
Cottage Cheese (locally produced)	0.0062	0.088	0.97
Inhalation	0.065	0.29	1.2
Mother's milk (mother on Diet 1)	0.0012	0.03	0.67
Prenatal exposure (mother on Diet 1)	0.014	0.092	0.89
Diet 1	6.1	39	250
Diet 2	2.2	15	97
Diet 3	0.31	1.6	8.7

Excess Lifetime Risk [ ]			
Diet 1	7.1E-04	1.1E-02	1.7E-01
Diet 2	3.2E-04	4.3E-03	5.9E-02
Diet 3	4.4E-05	4.7E-04	5.1E-03
Diet 4	1.8E-03	3.1E-02	4.3E-01

Relative Risk [ ]			
Diet 1	1.29	3.8	33
Diet 2	1.11	2.1	15
Diet 3	1.014	1.12	2.4
Diet 4	1.68	7.9	111

Probability of Causation [%]			
Diet 1	22.50	73.6	97
Diet 2	9.54	52.0	93
Diet 3	1.41	10.3	58
Diet 4	40.56	87.3	99

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	5	35	210
Commercial Milk (locally produced)	1.5	11	83
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	10	90	800
Beef (locally produced)	0.007	0.13	3
Leafy Vegetables (locally produced)	0.0014	0.016	0.14
Eggs (locally produced)	0.28	2.1	14
Cottage Cheese (locally produced)	0.0068	0.092	0.95
Inhalation	0.072	0.3	1.1
Mother's milk (mother on Diet 1)	0.0012	0.03	0.67
Prenatal exposure (mother on Diet 1)	0.014	0.092	0.89
Diet 1	5.6	38	230
Diet 2	2.2	15	94
Diet 3	0.31	1.6	10

	Excess Lifetime Risk [ ]		
Diet 1	1.0E-04	3.2E-03	5.4E-02
Diet 2	4.0E-05	1.2E-03	2.3E-02
Diet 3	5.8E-06	1.2E-04	2.3E-03
Diet 4	2.3E-04	7.3E-03	1.3E-01

	Relative Risk [ ]		
Diet 1	1.11	2.8	50
Diet 2	1.039	1.75	19
Diet 3	1.0051	1.084	2.9
Diet 4	1.27	6.4	121

	Probability of Causation [%]		
Diet 1	9.89	64.8	98
Diet 2	3.80	42.8	95
Diet 3	0.50	7.7	66
Diet 4	21.19	84.4	99

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	7.3	50
Commercial Milk (locally produced)	0.3	2.4	17
Commercial Milk (regionally mixed)	0.18	1.3	8
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0016	0.027	0.65
Leafy Vegetables (locally produced)	0.00029	0.0034	0.033
Eggs (locally produced)	0.051	0.43	3.5
Cottage Cheese (locally produced)	0.0014	0.019	0.21
Inhalation	0.015	0.064	0.25
Mother's milk (mother on Diet 1)	0.00029	0.0065	0.14
Prenatal exposure (mother on Diet 1)	0.0027	0.02	0.2
Diet 1	1.2	8	54
Diet 2	0.46	3.2	21
Diet 3	0.21	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	1.5E-04	2.4E-03	3.6E-02
Diet 2	6.9E-05	9.2E-04	1.2E-02
Diet 3	3.5E-05	3.8E-04	4.8E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.058	1.6	8.4
Diet 2	1.022	1.22	4.1
Diet 3	1.01	1.098	2.2
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	5.40	36.4	87
Diet 2	2.13	17.9	74
Diet 3	1.03	8.9	55
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	7.2	49
Commercial Milk (locally produced)	0.29	2.4	18
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0015	0.026	0.66
Leafy Vegetables (locally produced)	0.00028	0.0033	0.033
Eggs (locally produced)	0.058	0.44	3.3
Cottage Cheese (locally produced)	0.0014	0.018	0.23
Inhalation	0.015	0.064	0.25
Mother's milk (mother on Diet 1)	0.00029	0.0065	0.14
Prenatal exposure (mother on Diet 1)	0.0027	0.02	0.2
Diet 1	1.2	7.9	53
Diet 2	0.43	3.1	21
Diet 3	0.2	1.3	9.2

Excess Lifetime Risk [ ]			
Diet 1	2.0E-05	6.5E-04	1.1E-02
Diet 2	9.3E-06	2.4E-04	5.2E-03
Diet 3	4.3E-06	9.7E-05	2.0E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.024	1.41	12
Diet 2	1.0084	1.16	5.5
Diet 3	1.0037	1.067	2.8
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	2.36	28.4	91
Diet 2	0.83	13.2	81
Diet 3	0.37	6.3	64
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.2	20	140
Commercial Milk (locally produced)	0.88	6.3	49
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.004	0.073	1.8
Leafy Vegetables (locally produced)	0.00082	0.0092	0.089
Eggs (locally produced)	0.15	1.1	9.4
Cottage Cheese (locally produced)	0.0035	0.05	0.56
Inhalation	0.041	0.17	0.69
Mother's milk (mother on Diet 1)	0.00074	0.018	0.34
Prenatal exposure (mother on Diet 1)	0.0078	0.057	0.49
Diet 1	3.5	22	150
Diet 2	1.2	8.2	58
Diet 3	0.27	1.4	8.4

Excess Lifetime Risk [ ]			
Diet 1	4.2E-04	6.6E-03	9.7E-02
Diet 2	1.9E-04	2.5E-03	3.3E-02
Diet 3	3.9E-05	4.2E-04	4.9E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.16	2.6	20
Diet 2	1.062	1.62	9.4
Diet 3	1.012	1.1	2.3
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	13.63	61.2	95
Diet 2	5.86	38.1	89
Diet 3	1.19	9.5	57
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3	19	130
Commercial Milk (locally produced)	0.86	6.4	54
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.004	0.073	1.8
Leafy Vegetables (locally produced)	0.00078	0.009	0.09
Eggs (locally produced)	0.17	1.2	8.9
Cottage Cheese (locally produced)	0.0038	0.051	0.59
Inhalation	0.043	0.17	0.66
Mother's milk (mother on Diet 1)	0.00074	0.018	0.34
Prenatal exposure (mother on Diet 1)	0.0078	0.057	0.49
Diet 1	3.3	21	140
Diet 2	1.3	8.4	62
Diet 3	0.25	1.4	9.6

Excess Lifetime Risk [ ]			
Diet 1	5.1E-05	1.7E-03	3.3E-02
Diet 2	2.4E-05	6.4E-04	1.4E-02
Diet 3	4.9E-06	1.1E-04	2.1E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.069	2.1	26
Diet 2	1.022	1.44	12
Diet 3	1.0043	1.075	2.9
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	6.41	52.7	96
Diet 2	2.15	30.2	91
Diet 3	0.43	7.0	65
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.1	20	130
Commercial Milk (locally produced)	0.88	6.4	48
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	5.8	51	440
Beef (locally produced)	0.0039	0.073	1.6
Leafy Vegetables (locally produced)	0.00078	0.0092	0.088
Eggs (locally produced)	0.14	1.1	9.2
Cottage Cheese (locally produced)	0.0035	0.05	0.54
Inhalation	0.043	0.17	0.7
Mother's milk (mother on Diet 1)	0.00072	0.018	0.33
Prenatal exposure (mother on Diet 1)	0.0074	0.056	0.46
Diet 1	3.4	22	150
Diet 2	1.3	8.1	56
Diet 3	0.27	1.4	8.4

Excess Lifetime Risk [ ]			
Diet 1	4.0E-04	6.5E-03	9.2E-02
Diet 2	1.9E-04	2.4E-03	3.2E-02
Diet 3	3.9E-05	4.2E-04	4.9E-03
Diet 4	9.4E-04	1.7E-02	2.5E-01

Relative Risk [ ]			
Diet 1	1.15	2.6	20
Diet 2	1.059	1.61	9.3
Diet 3	1.012	1.1	2.3
Diet 4	1.36	4.8	58

Probability of Causation [%]			
Diet 1	13.28	61.0	95
Diet 2	5.53	37.7	89
Diet 3	1.19	9.5	57
Diet 4	26.11	79.0	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**  
**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3	19	120
Commercial Milk (locally produced)	0.82	6.3	51
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	5.8	50	470
Beef (locally produced)	0.0039	0.071	1.6
Leafy Vegetables (locally produced)	0.0008	0.009	0.086
Eggs (locally produced)	0.17	1.2	8.6
Cottage Cheese (locally produced)	0.0037	0.05	0.57
Inhalation	0.044	0.17	0.67
Mother's milk (mother on Diet 1)	0.00072	0.018	0.33
Prenatal exposure (mother on Diet 1)	0.0074	0.056	0.46
Diet 1	3.3	21	130
Diet 2	1.3	8.3	60
Diet 3	0.25	1.4	9.6

Excess Lifetime Risk [ ]			
Diet 1	4.9E-05	1.7E-03	3.1E-02
Diet 2	2.3E-05	6.3E-04	1.4E-02
Diet 3	4.9E-06	1.1E-04	2.1E-03
Diet 4	1.3E-04	4.3E-03	8.8E-02

Relative Risk [ ]			
Diet 1	1.07	2.1	26
Diet 2	1.022	1.42	12
Diet 3	1.0044	1.075	2.9
Diet 4	1.15	4	69

Probability of Causation [%]			
Diet 1	6.51	52.1	96
Diet 2	2.14	29.6	91
Diet 3	0.44	6.9	65
Diet 4	12.77	74.9	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.4	2.8	21
Commercial Milk (locally produced)	0.11	0.89	7.3
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	0.84	7.3	73
Beef (locally produced)	0.00053	0.01	0.24
Leafy Vegetables (locally produced)	0.0001	0.0013	0.014
Eggs (locally produced)	0.019	0.16	1.4
Cottage Cheese (locally produced)	0.00048	0.007	0.094
Inhalation	0.0063	0.026	0.11
Mother's milk (mother on Diet 1)	0.00012	0.0026	0.057
Prenatal exposure (mother on Diet 1)	0.0011	0.0077	0.082
Diet 1	0.45	3	23
Diet 2	0.17	1.2	9.1
Diet 3	0.19	1.3	8

Excess Lifetime Risk [ ]			
Diet 1	5.6E-05	9.0E-04	1.4E-02
Diet 2	2.6E-05	3.4E-04	4.8E-03
Diet 3	3.3E-05	3.7E-04	4.7E-03
Diet 4	1.4E-04	2.3E-03	4.4E-02

Relative Risk [ ]			
Diet 1	1.022	1.23	4.2
Diet 2	1.0079	1.084	2.1
Diet 3	1.0095	1.095	2.2
Diet 4	1.049	1.52	10.8

Probability of Causation [%]			
Diet 1	2.18	18.5	76
Diet 2	0.78	7.7	53
Diet 3	0.94	8.6	55
Diet 4	4.67	34.2	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.42	2.6	20
Commercial Milk (locally produced)	0.11	0.87	6.9
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	0.8	7.3	73
Beef (locally produced)	0.00052	0.01	0.23
Leafy Vegetables (locally produced)	0.0001	0.0013	0.013
Eggs (locally produced)	0.021	0.17	1.3
Cottage Cheese (locally produced)	0.00053	0.0069	0.094
Inhalation	0.0067	0.025	0.12
Mother's milk (mother on Diet 1)	0.00012	0.0026	0.057
Prenatal exposure (mother on Diet 1)	0.0011	0.0077	0.082
Diet 1	0.47	2.9	22
Diet 2	0.17	1.2	8.3
Diet 3	0.2	1.3	9.1

Excess Lifetime Risk [ ]			
Diet 1	6.8E-06	2.4E-04	5.2E-03
Diet 2	3.8E-06	9.0E-05	2.0E-03
Diet 3	4.0E-06	9.3E-05	2.0E-03
Diet 4	2.1E-05	6.0E-04	1.4E-02

Relative Risk [ ]			
Diet 1	1.0086	1.16	4.6
Diet 2	1.0031	1.059	2.7
Diet 3	1.0036	1.065	2.7
Diet 4	1.02	1.43	10.9

Probability of Causation [%]			
Diet 1	0.85	14.1	78
Diet 2	0.31	5.6	62
Diet 3	0.36	6.1	63
Diet 4	1.91	29.8	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0025	0.037	0.41
Inhalation	0.03	0.13	0.53
Mother's milk (mother on Diet 3)	0.00046	0.0083	0.13
Prenatal exposure (mother on Diet 3)	0.0046	0.026	0.2
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.24	1.4	8.3

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	3.7E-05	4.0E-04	4.8E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.011	1.1	2.3
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.13	9.3	56
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0028	0.037	0.41
Inhalation	0.031	0.13	0.5
Mother's milk (mother on Diet 3)	0.00046	0.0083	0.13
Prenatal exposure (mother on Diet 3)	0.0046	0.026	0.2
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.23	1.4	9.4

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	4.7E-06	1.0E-04	2.1E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0041	1.072	2.8
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.41	6.7	65
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.3	19	120
Commercial Milk (locally produced)	0.86	5.9	46
Commercial Milk (regionally mixed)	0.17	1.2	8
Goat Milk (locally produced)	5.9	49	400
Beef (locally produced)	0.0035	0.072	1.6
Leafy Vegetables (locally produced)	0.0008	0.0087	0.08
Eggs (locally produced)	0.15	1.1	8.5
Cottage Cheese (locally produced)	0.0035	0.047	0.51
Inhalation	0.04	0.16	0.68
Mother's milk (mother on Diet 1)	0.00071	0.017	0.34
Prenatal exposure (mother on Diet 1)	0.0073	0.051	0.44
Diet 1	3.6	20	130
Diet 2	1.2	7.5	57
Diet 3	0.26	1.4	8.5

Excess Lifetime Risk [ ]			
Diet 1	3.9E-04	6.0E-03	9.1E-02
Diet 2	2.0E-04	2.3E-03	3.3E-02
Diet 3	4.0E-05	4.2E-04	4.9E-03
Diet 4	1.0E-03	1.6E-02	2.7E-01

Relative Risk [ ]			
Diet 1	1.15	2.5	18
Diet 2	1.054	1.57	9.3
Diet 3	1.012	1.1	2.3
Diet 4	1.37	4.7	54

Probability of Causation [%]			
Diet 1	13.29	59.8	95
Diet 2	5.13	36.3	89
Diet 3	1.17	9.5	57
Diet 4	26.86	78.5	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.2	19	100
Commercial Milk (locally produced)	0.77	5.8	45
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	5.8	48	410
Beef (locally produced)	0.0035	0.069	1.6
Leafy Vegetables (locally produced)	0.00089	0.0087	0.078
Eggs (locally produced)	0.17	1.1	8.4
Cottage Cheese (locally produced)	0.0035	0.048	0.54
Inhalation	0.043	0.16	0.69
Mother's milk (mother on Diet 1)	0.00071	0.017	0.34
Prenatal exposure (mother on Diet 1)	0.0073	0.051	0.44
Diet 1	3.5	21	110
Diet 2	1.2	7.6	56
Diet 3	0.25	1.4	9.5

Excess Lifetime Risk [ ]			
Diet 1	4.7E-05	1.6E-03	2.9E-02
Diet 2	2.2E-05	6.0E-04	1.3E-02
Diet 3	4.9E-06	1.1E-04	2.2E-03
Diet 4	1.3E-04	3.8E-03	8.0E-02

Relative Risk [ ]			
Diet 1	1.065	2	24
Diet 2	1.024	1.4	12
Diet 3	1.0045	1.072	2.9
Diet 4	1.15	3.9	65

Probability of Causation [%]			
Diet 1	6.13	50.9	96
Diet 2	2.31	28.7	91
Diet 3	0.45	6.7	65
Diet 4	12.67	74.4	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.54	3.7	28
Commercial Milk (locally produced)	0.17	1.2	10
Commercial Milk (regionally mixed)	0.17	1.2	8
Goat Milk (locally produced)	1.1	9.8	93
Beef (locally produced)	0.00079	0.014	0.31
Leafy Vegetables (locally produced)	0.00014	0.0018	0.018
Eggs (locally produced)	0.027	0.21	2
Cottage Cheese (locally produced)	0.00074	0.0093	0.13
Inhalation	0.0083	0.036	0.16
Mother's milk (mother on Diet 1)	0.00017	0.0037	0.075
Prenatal exposure (mother on Diet 1)	0.0017	0.011	0.11
Diet 1	0.6	4.1	30
Diet 2	0.23	1.6	13
Diet 3	0.2	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	8.2E-05	1.2E-03	2.0E-02
Diet 2	2.8E-05	4.7E-04	6.4E-03
Diet 3	3.4E-05	3.7E-04	4.7E-03
Diet 4	1.7E-04	3.4E-03	5.3E-02

Relative Risk [ ]			
Diet 1	1.035	1.29	4.6
Diet 2	1.012	1.11	2.6
Diet 3	1.0099	1.096	2.2
Diet 4	1.076	1.75	13

Probability of Causation [%]			
Diet 1	3.34	22.5	78
Diet 2	1.16	10.2	61
Diet 3	0.98	8.7	55
Diet 4	7.07	42.6	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.52	3.8	28
Commercial Milk (locally produced)	0.17	1.2	9.8
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	1.2	9.9	98
Beef (locally produced)	0.00077	0.013	0.31
Leafy Vegetables (locally produced)	0.00014	0.0017	0.019
Eggs (locally produced)	0.028	0.23	1.8
Cottage Cheese (locally produced)	0.00075	0.0099	0.12
Inhalation	0.0086	0.036	0.15
Mother's milk (mother on Diet 1)	0.00017	0.0037	0.075
Prenatal exposure (mother on Diet 1)	0.0017	0.011	0.11
Diet 1	0.57	4.1	29
Diet 2	0.24	1.6	12
Diet 3	0.19	1.3	9.1

Excess Lifetime Risk [ ]			
Diet 1	9.6E-06	3.3E-04	6.4E-03
Diet 2	5.0E-06	1.3E-04	2.7E-03
Diet 3	4.1E-06	9.4E-05	2.0E-03
Diet 4	2.8E-05	8.0E-04	1.6E-02

Relative Risk [ ]			
Diet 1	1.012	1.21	6.1
Diet 2	1.004	1.084	3.2
Diet 3	1.0036	1.066	2.7
Diet 4	1.026	1.57	14

Probability of Causation [%]			
Diet 1	1.14	17.3	83
Diet 2	0.40	7.7	69
Diet 3	0.36	6.2	63
Diet 4	2.54	36.4	93

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0014	0.021	0.23
Inhalation	0.018	0.073	0.32
Mother's milk (mother on Diet 3)	0.00037	0.0069	0.12
Prenatal exposure (mother on Diet 3)	0.0037	0.022	0.19
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.22	1.3	8.2

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	3.5E-05	3.9E-04	4.8E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.011	1.098	2.2
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.05	9.0	55
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0016	0.022	0.23
Inhalation	0.019	0.075	0.3
Mother's milk (mother on Diet 3)	0.00037	0.0069	0.12
Prenatal exposure (mother on Diet 3)	0.0037	0.022	0.19
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.21	1.3	9.2

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	4.3E-06	9.9E-05	2.0E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0038	1.068	2.8
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.38	6.3	64
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.51	3.5	29
Commercial Milk (locally produced)	0.16	1.1	10
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	1	9.7	96
Beef (locally produced)	0.00074	0.013	0.34
Leafy Vegetables (locally produced)	0.00015	0.0017	0.016
Eggs (locally produced)	0.026	0.2	1.9
Cottage Cheese (locally produced)	0.00068	0.0091	0.12
Inhalation	0.0082	0.033	0.15
Mother's milk (mother on Diet 1)	0.00014	0.0034	0.068
Prenatal exposure (mother on Diet 1)	0.0013	0.01	0.11
Diet 1	0.56	3.9	31
Diet 2	0.23	1.5	12
Diet 3	0.2	1.3	8

Excess Lifetime Risk [ ]			
Diet 1	7.3E-05	1.3E-03	1.9E-02
Diet 2	3.5E-05	4.5E-04	7.1E-03
Diet 3	3.3E-05	3.7E-04	4.7E-03
Diet 4	1.8E-04	3.2E-03	5.6E-02

Relative Risk [ ]			
Diet 1	1.029	1.3	4.9
Diet 2	1.01	1.11	2.6
Diet 3	1.0097	1.096	2.2
Diet 4	1.066	1.74	12

Probability of Causation [%]			
Diet 1	2.78	22.7	79
Diet 2	1.02	9.8	62
Diet 3	0.96	8.7	55
Diet 4	6.21	42.4	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.54	3.5	27
Commercial Milk (locally produced)	0.16	1.1	10
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	1.1	9.5	110
Beef (locally produced)	0.00078	0.013	0.31
Leafy Vegetables (locally produced)	0.00016	0.0016	0.017
Eggs (locally produced)	0.028	0.21	1.8
Cottage Cheese (locally produced)	0.00069	0.0091	0.12
Inhalation	0.0074	0.034	0.14
Mother's milk (mother on Diet 1)	0.00014	0.0034	0.068
Prenatal exposure (mother on Diet 1)	0.0013	0.01	0.11
Diet 1	0.6	3.8	30
Diet 2	0.22	1.5	12
Diet 3	0.19	1.3	9.1

Excess Lifetime Risk [ ]			
Diet 1	9.8E-06	3.0E-04	6.3E-03
Diet 2	4.3E-06	1.1E-04	2.6E-03
Diet 3	4.0E-06	9.3E-05	2.0E-03
Diet 4	2.2E-05	7.4E-04	1.7E-02

Relative Risk [ ]			
Diet 1	1.012	1.21	6.2
Diet 2	1.0042	1.077	3.3
Diet 3	1.0036	1.066	2.7
Diet 4	1.024	1.56	17

Probability of Causation [%]			
Diet 1	1.18	17.2	84
Diet 2	0.42	7.2	70
Diet 3	0.36	6.2	63
Diet 4	2.36	35.8	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0022	0.031	0.34
Inhalation	0.028	0.11	0.46
Mother's milk (mother on Diet 3)	0.00043	0.0079	0.12
Prenatal exposure (mother on Diet 3)	0.0043	0.025	0.2
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.24	1.4	8.3

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	3.7E-05	4.0E-04	4.8E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.011	1.1	2.3
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.11	9.2	56
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0023	0.032	0.35
Inhalation	0.029	0.11	0.45
Mother's milk (mother on Diet 3)	0.00043	0.0079	0.12
Prenatal exposure (mother on Diet 3)	0.0043	0.025	0.2
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.23	1.4	9.3

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	4.6E-06	1.0E-04	2.1E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0041	1.07	2.8
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.41	6.5	64
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.7	17	110
Commercial Milk (locally produced)	0.8	5.7	42
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	5.5	46	390
Beef (locally produced)	0.0036	0.064	1.4
Leafy Vegetables (locally produced)	0.0007	0.0083	0.077
Eggs (locally produced)	0.13	1	8.3
Cottage Cheese (locally produced)	0.0033	0.044	0.49
Inhalation	0.04	0.16	0.7
Mother's milk (mother on Diet 1)	0.00068	0.016	0.31
Prenatal exposure (mother on Diet 1)	0.0073	0.05	0.43
Diet 1	3	19	130
Diet 2	1.2	7.5	50
Diet 3	0.26	1.4	8.5

Excess Lifetime Risk [ ]			
Diet 1	3.7E-04	5.7E-03	8.3E-02
Diet 2	1.5E-04	2.2E-03	2.9E-02
Diet 3	3.9E-05	4.2E-04	4.9E-03
Diet 4	8.6E-04	1.6E-02	2.3E-01

Relative Risk [ ]			
Diet 1	1.15	2.4	17
Diet 2	1.056	1.52	7.5
Diet 3	1.012	1.1	2.3
Diet 4	1.35	4.4	54

Probability of Causation [%]			
Diet 1	12.91	58.4	94
Diet 2	5.32	34.2	87
Diet 3	1.20	9.4	56
Diet 4	25.70	77.2	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways  
Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways  
Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)  
Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.7	18	100
Commercial Milk (locally produced)	0.8	5.7	44
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	5.6	44	410
Beef (locally produced)	0.0037	0.063	1.4
Leafy Vegetables (locally produced)	0.00074	0.008	0.08
Eggs (locally produced)	0.15	1	7.7
Cottage Cheese (locally produced)	0.0033	0.045	0.5
Inhalation	0.042	0.17	0.65
Mother's milk (mother on Diet 1)	0.00068	0.016	0.31
Prenatal exposure (mother on Diet 1)	0.0073	0.05	0.43
Diet 1	3	19	110
Diet 2	1.2	7.5	52
Diet 3	0.25	1.4	9.5

Excess Lifetime Risk [ ]			
Diet 1	4.5E-05	1.5E-03	2.8E-02
Diet 2	2.3E-05	5.6E-04	1.2E-02
Diet 3	4.8E-06	1.1E-04	2.1E-03
Diet 4	1.2E-04	3.8E-03	7.3E-02

Relative Risk [ ]			
Diet 1	1.062	1.98	24
Diet 2	1.021	1.39	10.9
Diet 3	1.0043	1.074	2.9
Diet 4	1.13	3.7	60

Probability of Causation [%]			
Diet 1	5.80	49.3	96
Diet 2	2.02	27.9	91
Diet 3	0.43	6.9	65
Diet 4	11.85	73.0	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.42	2.7	20
Commercial Milk (locally produced)	0.12	0.88	7.4
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	0.83	7.1	68
Beef (locally produced)	0.00052	0.01	0.24
Leafy Vegetables (locally produced)	0.0001	0.0012	0.013
Eggs (locally produced)	0.021	0.16	1.4
Cottage Cheese (locally produced)	0.00047	0.0069	0.083
Inhalation	0.0063	0.025	0.12
Mother's milk (mother on Diet 1)	0.00012	0.0026	0.051
Prenatal exposure (mother on Diet 1)	0.0011	0.0079	0.081
Diet 1	0.46	2.9	22
Diet 2	0.18	1.1	9.1
Diet 3	0.19	1.3	8

Excess Lifetime Risk [ ]			
Diet 1	5.2E-05	9.1E-04	1.6E-02
Diet 2	2.7E-05	3.3E-04	5.0E-03
Diet 3	3.3E-05	3.7E-04	4.7E-03
Diet 4	1.4E-04	2.3E-03	4.0E-02

Relative Risk [ ]			
Diet 1	1.02	1.23	3.7
Diet 2	1.007	1.085	2.2
Diet 3	1.0095	1.095	2.2
Diet 4	1.046	1.57	10.5

Probability of Causation [%]			
Diet 1	1.95	18.4	73
Diet 2	0.69	7.8	55
Diet 3	0.95	8.7	55
Diet 4	4.41	35.9	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.42	2.6	19
Commercial Milk (locally produced)	0.12	0.86	7.1
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	0.78	7.2	76
Beef (locally produced)	0.00054	0.0099	0.25
Leafy Vegetables (locally produced)	0.0001	0.0012	0.014
Eggs (locally produced)	0.022	0.17	1.3
Cottage Cheese (locally produced)	0.00052	0.0068	0.084
Inhalation	0.0064	0.026	0.11
Mother's milk (mother on Diet 1)	0.00012	0.0026	0.051
Prenatal exposure (mother on Diet 1)	0.0011	0.0079	0.081
Diet 1	0.46	2.9	21
Diet 2	0.17	1.1	8.9
Diet 3	0.19	1.3	9.1

Excess Lifetime Risk [ ]			
Diet 1	6.5E-06	2.4E-04	4.6E-03
Diet 2	3.1E-06	8.8E-05	1.8E-03
Diet 3	4.0E-06	9.3E-05	2.0E-03
Diet 4	1.9E-05	5.8E-04	1.3E-02

Relative Risk [ ]			
Diet 1	1.0083	1.16	4.7
Diet 2	1.003	1.059	2.6
Diet 3	1.0036	1.065	2.7
Diet 4	1.018	1.44	12

Probability of Causation [%]			
Diet 1	0.82	13.6	78
Diet 2	0.30	5.5	61
Diet 3	0.36	6.1	63
Diet 4	1.81	30.5	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.6	16	110
Commercial Milk (locally produced)	0.72	5.1	37
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	5.2	42	360
Beef (locally produced)	0.0032	0.06	1.3
Leafy Vegetables (locally produced)	0.00063	0.0075	0.07
Eggs (locally produced)	0.12	0.89	7.2
Cottage Cheese (locally produced)	0.003	0.041	0.44
Inhalation	0.039	0.15	0.62
Mother's milk (mother on Diet 1)	0.00064	0.015	0.29
Prenatal exposure (mother on Diet 1)	0.0065	0.046	0.4
Diet 1	2.9	18	120
Diet 2	1.1	6.7	46
Diet 3	0.26	1.4	8.4

Excess Lifetime Risk [ ]			
Diet 1	3.2E-04	5.2E-03	7.4E-02
Diet 2	1.5E-04	2.0E-03	2.5E-02
Diet 3	3.9E-05	4.1E-04	4.9E-03
Diet 4	8.0E-04	1.4E-02	2.1E-01

Relative Risk [ ]			
Diet 1	1.13	2.3	16
Diet 2	1.05	1.5	7.4
Diet 3	1.012	1.1	2.3
Diet 4	1.31	4.1	52

Probability of Causation [%]			
Diet 1	11.88	56.1	94
Diet 2	4.79	33.2	86
Diet 3	1.17	9.4	56
Diet 4	23.51	75.7	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.6	16	97
Commercial Milk (locally produced)	0.69	5.2	39
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	5	41	390
Beef (locally produced)	0.0031	0.059	1.3
Leafy Vegetables (locally produced)	0.00066	0.0074	0.068
Eggs (locally produced)	0.14	0.98	6.7
Cottage Cheese (locally produced)	0.0031	0.04	0.49
Inhalation	0.039	0.15	0.6
Mother's milk (mother on Diet 1)	0.00064	0.015	0.29
Prenatal exposure (mother on Diet 1)	0.0065	0.046	0.4
Diet 1	2.8	17	110
Diet 2	1.1	6.8	47
Diet 3	0.24	1.4	9.5

Excess Lifetime Risk [ ]			
Diet 1	4.5E-05	1.4E-03	2.6E-02
Diet 2	2.2E-05	5.1E-04	1.1E-02
Diet 3	4.8E-06	1.1E-04	2.1E-03
Diet 4	1.2E-04	3.5E-03	6.4E-02

Relative Risk [ ]			
Diet 1	1.054	1.9	22
Diet 2	1.019	1.34	9.7
Diet 3	1.0043	1.072	2.8
Diet 4	1.12	3.5	52

Probability of Causation [%]			
Diet 1	5.09	47.1	95
Diet 2	1.88	25.4	90
Diet 3	0.43	6.8	65
Diet 4	10.54	71.1	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1	6.8	47
Commercial Milk (locally produced)	0.3	2.2	17
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	2.2	18	160
Beef (locally produced)	0.0014	0.025	0.57
Leafy Vegetables (locally produced)	0.00027	0.0032	0.032
Eggs (locally produced)	0.052	0.38	3.2
Cottage Cheese (locally produced)	0.0013	0.017	0.2
Inhalation	0.015	0.063	0.27
Mother's milk (mother on Diet 1)	0.00028	0.0064	0.12
Prenatal exposure (mother on Diet 1)	0.0027	0.019	0.17
Diet 1	1.1	7.4	51
Diet 2	0.45	2.9	20
Diet 3	0.21	1.3	8.1

	Excess Lifetime Risk [ ]		
Diet 1	1.4E-04	2.2E-03	3.3E-02
Diet 2	6.3E-05	8.4E-04	1.1E-02
Diet 3	3.5E-05	3.8E-04	4.7E-03
Diet 4	3.3E-04	5.9E-03	9.1E-02

	Relative Risk [ ]		
Diet 1	1.056	1.55	7.6
Diet 2	1.022	1.21	3.6
Diet 3	1.01	1.098	2.2
Diet 4	1.12	2.3	22

	Probability of Causation [%]		
Diet 1	5.22	34.4	86
Diet 2	2.11	16.9	70
Diet 3	1.03	8.9	55
Diet 4	10.75	54.4	95

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.6	45
Commercial Milk (locally produced)	0.3	2.2	17
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	2.1	17	160
Beef (locally produced)	0.0013	0.025	0.55
Leafy Vegetables (locally produced)	0.00027	0.003	0.031
Eggs (locally produced)	0.056	0.4	3
Cottage Cheese (locally produced)	0.0013	0.017	0.21
Inhalation	0.016	0.064	0.25
Mother's milk (mother on Diet 1)	0.00028	0.0064	0.12
Prenatal exposure (mother on Diet 1)	0.0027	0.019	0.17
Diet 1	1.2	7.2	49
Diet 2	0.45	2.9	20
Diet 3	0.2	1.3	9.2

Excess Lifetime Risk [ ]			
Diet 1	1.9E-05	5.9E-04	1.1E-02
Diet 2	8.8E-06	2.1E-04	4.6E-03
Diet 3	4.3E-06	9.7E-05	2.0E-03
Diet 4	5.2E-05	1.4E-03	2.9E-02

Relative Risk [ ]			
Diet 1	1.022	1.39	9.6
Diet 2	1.0075	1.14	4.9
Diet 3	1.0038	1.067	2.8
Diet 4	1.048	2.1	25

Probability of Causation [%]			
Diet 1	2.16	27.4	88
Diet 2	0.75	12.1	78
Diet 3	0.38	6.3	64
Diet 4	4.52	49.7	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.17	1.2	8
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0013	0.019	0.2
Inhalation	0.017	0.069	0.29
Mother's milk (mother on Diet 3)	0.00037	0.0067	0.11
Prenatal exposure (mother on Diet 3)	0.0035	0.022	0.19
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.22	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	3.5E-05	3.8E-04	4.7E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.01	1.098	2.2
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.03	8.9	55
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0014	0.018	0.21
Inhalation	0.018	0.07	0.28
Mother's milk (mother on Diet 3)	0.00037	0.0067	0.11
Prenatal exposure (mother on Diet 3)	0.0035	0.022	0.19
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.21	1.3	9.2

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	4.3E-06	9.8E-05	2.0E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0038	1.068	2.8
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.38	6.3	64
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.3	8	55
Commercial Milk (locally produced)	0.37	2.6	19
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	2.7	21	180
Beef (locally produced)	0.0016	0.03	0.78
Leafy Vegetables (locally produced)	0.00037	0.0038	0.037
Eggs (locally produced)	0.06	0.47	3.7
Cottage Cheese (locally produced)	0.0014	0.021	0.22
Inhalation	0.019	0.083	0.33
Mother's milk (mother on Diet 1)	0.00034	0.008	0.14
Prenatal exposure (mother on Diet 1)	0.0035	0.025	0.2
Diet 1	1.4	8.7	61
Diet 2	0.54	3.4	23
Diet 3	0.23	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	1.7E-04	2.7E-03	4.2E-02
Diet 2	7.9E-05	1.0E-03	1.5E-02
Diet 3	3.6E-05	3.9E-04	4.8E-03
Diet 4	3.8E-04	7.2E-03	1.0E-01

Relative Risk [ ]			
Diet 1	1.064	1.65	8.7
Diet 2	1.025	1.25	4.2
Diet 3	1.011	1.099	2.2
Diet 4	1.14	2.6	28

Probability of Causation [%]			
Diet 1	6.05	39.4	88
Diet 2	2.45	20.0	76
Diet 3	1.05	9.0	55
Diet 4	12.41	60.9	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.3	8	51
Commercial Milk (locally produced)	0.37	2.6	22
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	2.5	20	180
Beef (locally produced)	0.0017	0.03	0.74
Leafy Vegetables (locally produced)	0.00034	0.0037	0.036
Eggs (locally produced)	0.067	0.5	3.7
Cottage Cheese (locally produced)	0.0016	0.02	0.25
Inhalation	0.021	0.084	0.34
Mother's milk (mother on Diet 1)	0.00034	0.008	0.14
Prenatal exposure (mother on Diet 1)	0.0035	0.025	0.2
Diet 1	1.5	8.8	54
Diet 2	0.54	3.4	25
Diet 3	0.21	1.3	9.3

Excess Lifetime Risk [ ]			
Diet 1	2.2E-05	7.2E-04	1.3E-02
Diet 2	1.0E-05	2.7E-04	5.8E-03
Diet 3	4.4E-06	9.9E-05	2.1E-03
Diet 4	5.4E-05	1.7E-03	3.9E-02

Relative Risk [ ]			
Diet 1	1.026	1.46	11
Diet 2	1.0094	1.18	5.1
Diet 3	1.0039	1.069	2.8
Diet 4	1.056	2.2	31

Probability of Causation [%]			
Diet 1	2.55	31.5	91
Diet 2	0.94	15.4	81
Diet 3	0.39	6.4	64
Diet 4	5.34	55.5	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.4	9	63
Commercial Milk (locally produced)	0.42	2.9	20
Commercial Milk (regionally mixed)	0.18	1.3	8
Goat Milk (locally produced)	2.9	24	210
Beef (locally produced)	0.002	0.034	0.92
Leafy Vegetables (locally produced)	0.00035	0.0043	0.042
Eggs (locally produced)	0.074	0.53	4.4
Cottage Cheese (locally produced)	0.0017	0.023	0.24
Inhalation	0.022	0.095	0.4
Mother's milk (mother on Diet 1)	0.00043	0.0087	0.17
Prenatal exposure (mother on Diet 1)	0.0038	0.026	0.24
Diet 1	1.6	9.9	70
Diet 2	0.61	3.8	24
Diet 3	0.23	1.3	8.2

Excess Lifetime Risk [ ]			
Diet 1	1.9E-04	3.1E-03	4.9E-02
Diet 2	9.5E-05	1.2E-03	1.5E-02
Diet 3	3.6E-05	3.9E-04	4.8E-03
Diet 4	4.7E-04	8.2E-03	1.2E-01

Relative Risk [ ]			
Diet 1	1.076	1.75	9.2
Diet 2	1.027	1.29	4.9
Diet 3	1.011	1.1	2.2
Diet 4	1.17	2.8	29

Probability of Causation [%]			
Diet 1	7.06	42.7	89
Diet 2	2.67	22.5	79
Diet 3	1.07	9.1	56
Diet 4	14.29	63.8	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.4	8.8	56
Commercial Milk (locally produced)	0.41	3	23
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	2.7	23	230
Beef (locally produced)	0.002	0.034	0.87
Leafy Vegetables (locally produced)	0.00035	0.0043	0.04
Eggs (locally produced)	0.077	0.56	4.3
Cottage Cheese (locally produced)	0.0019	0.023	0.26
Inhalation	0.022	0.095	0.36
Mother's milk (mother on Diet 1)	0.00043	0.0087	0.17
Prenatal exposure (mother on Diet 1)	0.0038	0.026	0.24
Diet 1	1.6	9.6	61
Diet 2	0.61	3.8	27
Diet 3	0.22	1.4	9.3

Excess Lifetime Risk [ ]			
Diet 1	3.0E-05	7.9E-04	1.6E-02
Diet 2	1.2E-05	3.0E-04	6.4E-03
Diet 3	4.5E-06	1.0E-04	2.1E-03
Diet 4	6.2E-05	1.9E-03	3.9E-02

Relative Risk [ ]			
Diet 1	1.033	1.51	13
Diet 2	1.011	1.2	5.9
Diet 3	1.0039	1.069	2.8
Diet 4	1.074	2.4	33

Probability of Causation [%]			
Diet 1	3.20	33.7	92
Diet 2	1.13	16.6	83
Diet 3	0.39	6.4	64
Diet 4	6.87	58.4	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.95	5.6	34
Commercial Milk (locally produced)	0.26	1.7	14
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.001	0.021	0.47
Leafy Vegetables (locally produced)	0.00025	0.0027	0.025
Eggs (locally produced)	0.045	0.32	2.5
Cottage Cheese (locally produced)	0.00098	0.014	0.15
Inhalation	0.014	0.059	0.25
Mother's milk (mother on Diet 1)	0.00021	0.0053	0.097
Prenatal exposure (mother on Diet 1)	0.0024	0.016	0.13
Diet 1	1	6.2	37
Diet 2	0.38	2.3	16
Diet 3	0.21	1.3	8.1

	Excess Lifetime Risk [ ]		
Diet 1	1.1E-04	1.8E-03	3.0E-02
Diet 2	6.2E-05	6.9E-04	1.0E-02
Diet 3	3.5E-05	3.8E-04	4.8E-03
Diet 4	--	--	--

	Relative Risk [ ]		
Diet 1	1.045	1.45	6.2
Diet 2	1.017	1.17	3.6
Diet 3	1.01	1.097	2.2
Diet 4	--	--	--

	Probability of Causation [%]		
Diet 1	4.30	31.1	84
Diet 2	1.64	14.4	72
Diet 3	1.01	8.9	55
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1	5.7	34
Commercial Milk (locally produced)	0.25	1.7	13
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.001	0.021	0.45
Leafy Vegetables (locally produced)	0.00026	0.0026	0.025
Eggs (locally produced)	0.048	0.34	2.5
Cottage Cheese (locally produced)	0.0011	0.015	0.15
Inhalation	0.014	0.057	0.25
Mother's milk (mother on Diet 1)	0.00021	0.0053	0.097
Prenatal exposure (mother on Diet 1)	0.0024	0.016	0.13
Diet 1	1.1	6.2	36
Diet 2	0.39	2.2	15
Diet 3	0.2	1.3	9.2

Excess Lifetime Risk [ ]			
Diet 1	1.4E-05	4.8E-04	8.2E-03
Diet 2	6.3E-06	1.7E-04	3.9E-03
Diet 3	4.2E-06	9.6E-05	2.0E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.018	1.32	7.7
Diet 2	1.0066	1.12	4.1
Diet 3	1.0038	1.066	2.8
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	1.81	24.3	87
Diet 2	0.66	10.5	75
Diet 3	0.38	6.2	64
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**

**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	7.3	47
Commercial Milk (locally produced)	0.34	2.3	16
Commercial Milk (regionally mixed)	0.17	1.2	8
Goat Milk (locally produced)	2.4	19	170
Beef (locally produced)	0.0015	0.026	0.59
Leafy Vegetables (locally produced)	0.0003	0.0033	0.032
Eggs (locally produced)	0.054	0.41	3.6
Cottage Cheese (locally produced)	0.0012	0.018	0.19
Inhalation	0.019	0.075	0.32
Mother's milk (mother on Diet 1)	0.00032	0.0069	0.12
Prenatal exposure (mother on Diet 1)	0.0031	0.021	0.18
Diet 1	1.3	7.8	51
Diet 2	0.51	3.1	19
Diet 3	0.22	1.3	8.2

Excess Lifetime Risk [ ]			
Diet 1	1.4E-04	2.4E-03	3.5E-02
Diet 2	7.4E-05	8.9E-04	1.2E-02
Diet 3	3.5E-05	3.8E-04	4.8E-03
Diet 4	3.6E-04	6.2E-03	9.2E-02

Relative Risk [ ]			
Diet 1	1.063	1.61	7.5
Diet 2	1.022	1.22	3.7
Diet 3	1.011	1.098	2.3
Diet 4	1.14	2.4	21

Probability of Causation [%]			
Diet 1	5.95	37.7	86
Diet 2	2.12	18.2	73
Diet 3	1.06	9.0	56
Diet 4	11.93	58.6	95

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.1	6.9	42
Commercial Milk (locally produced)	0.33	2.3	17
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	2.3	19	170
Beef (locally produced)	0.0015	0.026	0.61
Leafy Vegetables (locally produced)	0.00031	0.0032	0.033
Eggs (locally produced)	0.055	0.43	2.9
Cottage Cheese (locally produced)	0.0014	0.018	0.2
Inhalation	0.019	0.077	0.31
Mother's milk (mother on Diet 1)	0.00032	0.0069	0.12
Prenatal exposure (mother on Diet 1)	0.0031	0.021	0.18
Diet 1	1.2	7.6	46
Diet 2	0.49	3.1	20
Diet 3	0.21	1.3	9.2

Excess Lifetime Risk [ ]			
Diet 1	1.9E-05	6.3E-04	1.1E-02
Diet 2	8.8E-06	2.4E-04	4.8E-03
Diet 3	4.4E-06	9.9E-05	2.0E-03
Diet 4	5.0E-05	1.5E-03	3.2E-02

Relative Risk [ ]			
Diet 1	1.022	1.39	10.1
Diet 2	1.0086	1.15	5.2
Diet 3	1.0038	1.068	2.8
Diet 4	1.056	2.1	28

Probability of Causation [%]			
Diet 1	2.15	28.0	90
Diet 2	0.85	13.0	81
Diet 3	0.38	6.4	64
Diet 4	5.29	52.5	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.5	9.7	62
Commercial Milk (locally produced)	0.45	3.1	21
Commercial Milk (regionally mixed)	0.17	1.2	8
Goat Milk (locally produced)	3	25	220
Beef (locally produced)	0.002	0.035	0.85
Leafy Vegetables (locally produced)	0.00039	0.0046	0.042
Eggs (locally produced)	0.074	0.55	4.4
Cottage Cheese (locally produced)	0.0016	0.025	0.26
Inhalation	0.024	0.1	0.43
Mother's milk (mother on Diet 1)	0.00043	0.0093	0.19
Prenatal exposure (mother on Diet 1)	0.0043	0.029	0.25
Diet 1	1.7	11	67
Diet 2	0.66	4	25
Diet 3	0.23	1.3	8.2

Excess Lifetime Risk [ ]			
Diet 1	2.0E-04	3.2E-03	4.9E-02
Diet 2	1.0E-04	1.2E-03	1.6E-02
Diet 3	3.6E-05	4.0E-04	4.8E-03
Diet 4	5.1E-04	8.7E-03	1.2E-01

Relative Risk [ ]			
Diet 1	1.082	1.81	9.7
Diet 2	1.031	1.31	4.7
Diet 3	1.011	1.1	2.3
Diet 4	1.19	2.9	31

Probability of Causation [%]			
Diet 1	7.56	44.6	90
Diet 2	2.98	23.9	79
Diet 3	1.09	9.1	56
Diet 4	15.91	65.6	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.5	9.5	55
Commercial Milk (locally produced)	0.45	3.2	22
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	2.9	25	230
Beef (locally produced)	0.0021	0.035	0.82
Leafy Vegetables (locally produced)	0.00038	0.0044	0.039
Eggs (locally produced)	0.084	0.59	4.2
Cottage Cheese (locally produced)	0.0021	0.025	0.27
Inhalation	0.025	0.11	0.4
Mother's milk (mother on Diet 1)	0.00043	0.0093	0.19
Prenatal exposure (mother on Diet 1)	0.0043	0.029	0.25
Diet 1	1.7	10	60
Diet 2	0.64	4.1	26
Diet 3	0.22	1.4	9.3

Excess Lifetime Risk [ ]			
Diet 1	2.8E-05	8.4E-04	1.5E-02
Diet 2	1.2E-05	3.1E-04	6.5E-03
Diet 3	4.5E-06	1.0E-04	2.1E-03
Diet 4	6.7E-05	2.0E-03	4.0E-02

Relative Risk [ ]			
Diet 1	1.035	1.54	14
Diet 2	1.012	1.21	5.9
Diet 3	1.004	1.07	2.8
Diet 4	1.077	2.5	34

Probability of Causation [%]			
Diet 1	3.34	35.1	93
Diet 2	1.14	17.4	83
Diet 3	0.40	6.5	64
Diet 4	7.16	59.7	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.88	5.3	37
Commercial Milk (locally produced)	0.23	1.8	13
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	1.7	14	120
Beef (locally produced)	0.0012	0.02	0.46
Leafy Vegetables (locally produced)	0.00022	0.0025	0.025
Eggs (locally produced)	0.039	0.3	2.5
Cottage Cheese (locally produced)	0.001	0.014	0.16
Inhalation	0.015	0.06	0.25
Mother's milk (mother on Diet 1)	0.00027	0.0055	0.1
Prenatal exposure (mother on Diet 1)	0.0024	0.016	0.15
Diet 1	0.98	5.8	41
Diet 2	0.35	2.3	16
Diet 3	0.21	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	1.1E-04	1.8E-03	2.9E-02
Diet 2	5.5E-05	6.8E-04	8.8E-03
Diet 3	3.5E-05	3.8E-04	4.7E-03
Diet 4	2.7E-04	4.8E-03	7.5E-02

Relative Risk [ ]			
Diet 1	1.045	1.44	6.1
Diet 2	1.017	1.17	3
Diet 3	1.01	1.098	2.2
Diet 4	1.1	2	18

Probability of Causation [%]			
Diet 1	4.26	30.5	83
Diet 2	1.68	14.4	67
Diet 3	1.02	8.9	55
Diet 4	9.04	51.0	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.88	5.3	35
Commercial Milk (locally produced)	0.24	1.8	13
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	1.7	14	130
Beef (locally produced)	0.0011	0.02	0.44
Leafy Vegetables (locally produced)	0.00022	0.0025	0.024
Eggs (locally produced)	0.045	0.32	2.4
Cottage Cheese (locally produced)	0.0011	0.014	0.16
Inhalation	0.015	0.061	0.24
Mother's milk (mother on Diet 1)	0.00027	0.0055	0.1
Prenatal exposure (mother on Diet 1)	0.0024	0.016	0.15
Diet 1	0.97	5.8	38
Diet 2	0.36	2.3	15
Diet 3	0.2	1.3	9.2

Excess Lifetime Risk [ ]			
Diet 1	1.6E-05	4.6E-04	8.7E-03
Diet 2	7.3E-06	1.7E-04	3.8E-03
Diet 3	4.3E-06	9.7E-05	2.0E-03
Diet 4	4.0E-05	1.1E-03	2.4E-02

Relative Risk [ ]			
Diet 1	1.017	1.32	7.8
Diet 2	1.006	1.12	3.9
Diet 3	1.0038	1.067	2.8
Diet 4	1.039	1.87	20

Probability of Causation [%]			
Diet 1	1.70	24.2	87
Diet 2	0.60	10.5	74
Diet 3	0.38	6.3	64
Diet 4	3.76	46.5	95

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.54	3.2	20
Commercial Milk (locally produced)	0.15	1	7.8
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	0.99	8.3	69
Beef (locally produced)	0.00062	0.012	0.27
Leafy Vegetables (locally produced)	0.00014	0.0015	0.014
Eggs (locally produced)	0.026	0.18	1.4
Cottage Cheese (locally produced)	0.00057	0.0081	0.089
Inhalation	0.0079	0.033	0.14
Mother's milk (mother on Diet 1)	0.00012	0.003	0.057
Prenatal exposure (mother on Diet 1)	0.0014	0.0092	0.078
Diet 1	0.59	3.5	22
Diet 2	0.22	1.3	9.5
Diet 3	0.2	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	6.7E-05	1.1E-03	1.7E-02
Diet 2	3.6E-05	4.0E-04	5.8E-03
Diet 3	3.4E-05	3.7E-04	4.7E-03
Diet 4	1.8E-04	2.7E-03	4.8E-02

Relative Risk [ ]			
Diet 1	1.025	1.26	4
Diet 2	1.0097	1.097	2.4
Diet 3	1.0098	1.095	2.2
Diet 4	1.063	1.64	9.8

Probability of Causation [%]			
Diet 1	2.47	20.5	75
Diet 2	0.96	8.9	59
Diet 3	0.97	8.7	55
Diet 4	5.90	38.9	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.57	3.2	19
Commercial Milk (locally produced)	0.14	0.99	7.5
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	0.99	8.2	71
Beef (locally produced)	0.00059	0.012	0.26
Leafy Vegetables (locally produced)	0.00015	0.0015	0.014
Eggs (locally produced)	0.028	0.2	1.4
Cottage Cheese (locally produced)	0.00062	0.0082	0.084
Inhalation	0.008	0.032	0.14
Mother's milk (mother on Diet 1)	0.00012	0.003	0.057
Prenatal exposure (mother on Diet 1)	0.0014	0.0092	0.078
Diet 1	0.62	3.5	21
Diet 2	0.22	1.3	9
Diet 3	0.19	1.3	9.1

Excess Lifetime Risk [ ]			
Diet 1	7.8E-06	2.8E-04	4.8E-03
Diet 2	3.7E-06	1.0E-04	2.2E-03
Diet 3	4.0E-06	9.3E-05	2.0E-03
Diet 4	2.1E-05	6.7E-04	1.5E-02

Relative Risk [ ]			
Diet 1	1.011	1.19	4.8
Diet 2	1.0038	1.069	2.7
Diet 3	1.0036	1.065	2.7
Diet 4	1.026	1.5	12

Probability of Causation [%]			
Diet 1	1.04	15.7	79
Diet 2	0.38	6.5	63
Diet 3	0.36	6.1	64
Diet 4	2.49	33.2	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.2	7.5	49
Commercial Milk (locally produced)	0.36	2.5	18
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	2.6	20	160
Beef (locally produced)	0.0015	0.028	0.72
Leafy Vegetables (locally produced)	0.00033	0.0036	0.034
Eggs (locally produced)	0.057	0.43	3.4
Cottage Cheese (locally produced)	0.0013	0.019	0.2
Inhalation	0.02	0.085	0.33
Mother's milk (mother on Diet 1)	0.00033	0.0076	0.13
Prenatal exposure (mother on Diet 1)	0.0034	0.024	0.19
Diet 1	1.3	8.2	54
Diet 2	0.53	3.2	21
Diet 3	0.23	1.3	8.2

Excess Lifetime Risk [ ]			
Diet 1	1.6E-04	2.5E-03	4.0E-02
Diet 2	7.5E-05	9.7E-04	1.3E-02
Diet 3	3.6E-05	3.9E-04	4.8E-03
Diet 4	3.7E-04	6.8E-03	9.6E-02

Relative Risk [ ]			
Diet 1	1.063	1.62	8
Diet 2	1.025	1.25	3.9
Diet 3	1.011	1.099	2.2
Diet 4	1.13	2.5	25

Probability of Causation [%]			
Diet 1	5.90	38.0	87
Diet 2	2.41	19.7	74
Diet 3	1.05	9.0	56
Diet 4	11.85	59.5	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.2	7.4	45
Commercial Milk (locally produced)	0.36	2.5	20
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	2.4	19	170
Beef (locally produced)	0.0016	0.029	0.66
Leafy Vegetables (locally produced)	0.00032	0.0035	0.034
Eggs (locally produced)	0.065	0.47	3.5
Cottage Cheese (locally produced)	0.0016	0.019	0.22
Inhalation	0.021	0.085	0.34
Mother's milk (mother on Diet 1)	0.00033	0.0076	0.13
Prenatal exposure (mother on Diet 1)	0.0034	0.024	0.19
Diet 1	1.4	8.1	48
Diet 2	0.53	3.2	23
Diet 3	0.21	1.3	9.3

Excess Lifetime Risk [ ]			
Diet 1	2.0E-05	6.7E-04	1.2E-02
Diet 2	9.4E-06	2.5E-04	5.6E-03
Diet 3	4.4E-06	9.9E-05	2.1E-03
Diet 4	5.2E-05	1.6E-03	3.3E-02

Relative Risk [ ]			
Diet 1	1.025	1.45	10.9
Diet 2	1.0092	1.17	5
Diet 3	1.0039	1.069	2.8
Diet 4	1.056	2.2	29

Probability of Causation [%]			
Diet 1	2.48	31.0	91
Diet 2	0.91	14.5	80
Diet 3	0.39	6.4	64
Diet 4	5.33	54.0	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.26	1.8	13
Commercial Milk (locally produced)	0.077	0.59	4.4
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	0.49	4.7	42
Beef (locally produced)	0.00034	0.0068	0.15
Leafy Vegetables (locally produced)	0.000072	0.00087	0.0084
Eggs (locally produced)	0.012	0.1	0.85
Cottage Cheese (locally produced)	0.00031	0.0046	0.051
Inhalation	0.0045	0.019	0.084
Mother's milk (mother on Diet 1)	0.00007	0.0018	0.033
Prenatal exposure (mother on Diet 1)	0.00073	0.0055	0.046
Diet 1	0.29	2	14
Diet 2	0.11	0.77	5.2
Diet 3	0.19	1.3	8

Excess Lifetime Risk [ ]			
Diet 1	3.3E-05	6.0E-04	9.1E-03
Diet 2	1.7E-05	2.3E-04	3.3E-03
Diet 3	3.3E-05	3.7E-04	4.7E-03
Diet 4	8.4E-05	1.5E-03	2.4E-02

Relative Risk [ ]			
Diet 1	1.013	1.15	2.7
Diet 2	1.005	1.056	1.74
Diet 3	1.0094	1.095	2.2
Diet 4	1.032	1.36	6.4

Probability of Causation [%]			
Diet 1	1.27	12.6	62
Diet 2	0.50	5.3	41
Diet 3	0.93	8.6	55
Diet 4	3.04	25.9	84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	1.8	12
Commercial Milk (locally produced)	0.073	0.59	4.3
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	0.49	4.7	44
Beef (locally produced)	0.00036	0.0067	0.15
Leafy Vegetables (locally produced)	0.000071	0.00084	0.0087
Eggs (locally produced)	0.014	0.11	0.83
Cottage Cheese (locally produced)	0.00034	0.0046	0.054
Inhalation	0.0045	0.019	0.083
Mother's milk (mother on Diet 1)	0.00007	0.0018	0.033
Prenatal exposure (mother on Diet 1)	0.00073	0.0055	0.046
Diet 1	0.31	2	13
Diet 2	0.11	0.75	5.2
Diet 3	0.19	1.3	9

Excess Lifetime Risk [ ]			
Diet 1	4.4E-06	1.6E-04	3.0E-03
Diet 2	2.2E-06	6.0E-05	1.3E-03
Diet 3	3.9E-06	9.2E-05	2.0E-03
Diet 4	1.2E-05	3.8E-04	8.4E-03

Relative Risk [ ]			
Diet 1	1.0057	1.1	3.2
Diet 2	1.002	1.04	1.96
Diet 3	1.0036	1.065	2.7
Diet 4	1.014	1.28	7.1

Probability of Causation [%]			
Diet 1	0.57	9.4	68
Diet 2	0.20	3.8	48
Diet 3	0.36	6.1	63
Diet 4	1.37	21.6	85

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1	6.3	40
Commercial Milk (locally produced)	0.31	2.1	15
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	2.1	16	140
Beef (locally produced)	0.0013	0.023	0.59
Leafy Vegetables (locally produced)	0.00027	0.003	0.028
Eggs (locally produced)	0.048	0.36	2.9
Cottage Cheese (locally produced)	0.0011	0.016	0.17
Inhalation	0.017	0.07	0.28
Mother's milk (mother on Diet 1)	0.00028	0.0063	0.11
Prenatal exposure (mother on Diet 1)	0.0029	0.019	0.15
Diet 1	1.1	6.9	44
Diet 2	0.45	2.7	18
Diet 3	0.22	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	1.4E-04	2.1E-03	3.2E-02
Diet 2	6.4E-05	8.0E-04	1.1E-02
Diet 3	3.5E-05	3.8E-04	4.8E-03
Diet 4	3.2E-04	5.8E-03	8.1E-02

Relative Risk [ ]			
Diet 1	1.054	1.51	6.8
Diet 2	1.021	1.2	3.4
Diet 3	1.011	1.098	2.2
Diet 4	1.12	2.2	20

Probability of Causation [%]			
Diet 1	5.09	33.9	85
Diet 2	2.03	16.6	71
Diet 3	1.04	8.9	55
Diet 4	10.50	55.0	95

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1	6.2	38
Commercial Milk (locally produced)	0.3	2.1	16
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	2	16	140
Beef (locally produced)	0.0013	0.024	0.55
Leafy Vegetables (locally produced)	0.00027	0.0029	0.028
Eggs (locally produced)	0.056	0.39	2.8
Cottage Cheese (locally produced)	0.0013	0.016	0.18
Inhalation	0.017	0.071	0.28
Mother's milk (mother on Diet 1)	0.00028	0.0063	0.11
Prenatal exposure (mother on Diet 1)	0.0029	0.019	0.15
Diet 1	1.1	6.8	41
Diet 2	0.45	2.7	19
Diet 3	0.2	1.3	9.2

Excess Lifetime Risk [ ]			
Diet 1	1.7E-05	5.6E-04	1.0E-02
Diet 2	8.3E-06	2.1E-04	4.6E-03
Diet 3	4.3E-06	9.8E-05	2.0E-03
Diet 4	4.6E-05	1.4E-03	2.7E-02

Relative Risk [ ]			
Diet 1	1.021	1.37	9
Diet 2	1.0076	1.14	4.3
Diet 3	1.0038	1.068	2.8
Diet 4	1.047	1.98	24

Probability of Causation [%]			
Diet 1	2.03	26.8	89
Diet 2	0.76	12.4	77
Diet 3	0.38	6.3	64
Diet 4	4.44	49.4	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.49	3.1	19
Commercial Milk (locally produced)	0.14	0.99	7.5
Commercial Milk (regionally mixed)	0.18	1.3	8
Goat Milk (locally produced)	0.97	8	67
Beef (locally produced)	0.00058	0.011	0.25
Leafy Vegetables (locally produced)	0.00013	0.0014	0.014
Eggs (locally produced)	0.023	0.18	1.4
Cottage Cheese (locally produced)	0.00054	0.008	0.081
Inhalation	0.0076	0.033	0.14
Mother's milk (mother on Diet 1)	0.00012	0.0029	0.061
Prenatal exposure (mother on Diet 1)	0.0014	0.0091	0.078
Diet 1	0.53	3.4	21
Diet 2	0.2	1.3	8.6
Diet 3	0.2	1.3	8

Excess Lifetime Risk [ ]			
Diet 1	6.1E-05	1.0E-03	1.6E-02
Diet 2	3.2E-05	3.8E-04	5.8E-03
Diet 3	3.4E-05	3.7E-04	4.7E-03
Diet 4	1.6E-04	2.7E-03	4.3E-02

Relative Risk [ ]			
Diet 1	1.026	1.25	3.7
Diet 2	1.0093	1.096	2.3
Diet 3	1.0098	1.096	2.2
Diet 4	1.06	1.62	10.4

Probability of Causation [%]			
Diet 1	2.55	20.1	72
Diet 2	0.92	8.7	56
Diet 3	0.97	8.7	55
Diet 4	5.62	37.8	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.5	3.1	18
Commercial Milk (locally produced)	0.13	0.99	6.8
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	0.9	7.8	71
Beef (locally produced)	0.00059	0.011	0.25
Leafy Vegetables (locally produced)	0.00013	0.0014	0.013
Eggs (locally produced)	0.026	0.19	1.3
Cottage Cheese (locally produced)	0.0006	0.008	0.083
Inhalation	0.0079	0.033	0.14
Mother's milk (mother on Diet 1)	0.00012	0.0029	0.061
Prenatal exposure (mother on Diet 1)	0.0014	0.0091	0.078
Diet 1	0.55	3.4	20
Diet 2	0.2	1.3	8.1
Diet 3	0.19	1.3	9.1

Excess Lifetime Risk [ ]			
Diet 1	8.2E-06	2.7E-04	4.6E-03
Diet 2	3.5E-06	9.9E-05	2.1E-03
Diet 3	4.0E-06	9.3E-05	2.0E-03
Diet 4	2.0E-05	6.4E-04	1.3E-02

Relative Risk [ ]			
Diet 1	1.01	1.17	4.8
Diet 2	1.0036	1.065	2.6
Diet 3	1.0036	1.065	2.7
Diet 4	1.024	1.48	12

Probability of Causation [%]			
Diet 1	0.99	14.6	79
Diet 2	0.36	6.1	60
Diet 3	0.36	6.1	63
Diet 4	2.38	32.0	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.78	4.9	33
Commercial Milk (locally produced)	0.23	1.6	11
Commercial Milk (regionally mixed)	0.17	1.2	8
Goat Milk (locally produced)	1.6	13	110
Beef (locally produced)	0.00096	0.018	0.41
Leafy Vegetables (locally produced)	0.00021	0.0024	0.021
Eggs (locally produced)	0.037	0.28	2.2
Cottage Cheese (locally produced)	0.00089	0.013	0.13
Inhalation	0.013	0.053	0.22
Mother's milk (mother on Diet 1)	0.00019	0.0048	0.083
Prenatal exposure (mother on Diet 1)	0.002	0.015	0.11
Diet 1	0.86	5.5	36
Diet 2	0.34	2.1	14
Diet 3	0.21	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	1.0E-04	1.6E-03	2.4E-02
Diet 2	4.8E-05	6.3E-04	8.0E-03
Diet 3	3.4E-05	3.8E-04	4.7E-03
Diet 4	2.3E-04	4.3E-03	6.0E-02

Relative Risk [ ]			
Diet 1	1.04	1.39	5.3
Diet 2	1.015	1.16	2.9
Diet 3	1.01	1.097	2.2
Diet 4	1.089	1.98	15

Probability of Causation [%]			
Diet 1	3.81	27.9	80
Diet 2	1.52	13.6	65
Diet 3	1.00	8.9	55
Diet 4	8.14	48.9	93

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.79	4.8	28
Commercial Milk (locally produced)	0.23	1.6	12
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	1.5	12	120
Beef (locally produced)	0.001	0.018	0.42
Leafy Vegetables (locally produced)	0.0002	0.0023	0.021
Eggs (locally produced)	0.042	0.3	2.1
Cottage Cheese (locally produced)	0.00096	0.012	0.15
Inhalation	0.014	0.054	0.22
Mother's milk (mother on Diet 1)	0.00019	0.0048	0.083
Prenatal exposure (mother on Diet 1)	0.002	0.015	0.11
Diet 1	0.87	5.3	31
Diet 2	0.34	2.1	14
Diet 3	0.2	1.3	9.2

Excess Lifetime Risk [ ]			
Diet 1	1.2E-05	4.3E-04	7.8E-03
Diet 2	6.3E-06	1.7E-04	3.6E-03
Diet 3	4.1E-06	9.6E-05	2.0E-03
Diet 4	3.3E-05	1.1E-03	2.0E-02

Relative Risk [ ]			
Diet 1	1.017	1.29	7.4
Diet 2	1.0058	1.1	3.5
Diet 3	1.0037	1.066	2.8
Diet 4	1.04	1.78	18

Probability of Causation [%]			
Diet 1	1.71	22.0	85
Diet 2	0.57	9.4	71
Diet 3	0.37	6.2	64
Diet 4	3.85	43.1	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**

**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.41	2.8	19
Commercial Milk (locally produced)	0.12	0.92	6.2
Commercial Milk (regionally mixed)	0.17	1.2	8
Goat Milk (locally produced)	0.9	7.4	68
Beef (locally produced)	0.00058	0.01	0.26
Leafy Vegetables (locally produced)	0.00011	0.0013	0.012
Eggs (locally produced)	0.022	0.16	1.3
Cottage Cheese (locally produced)	0.00048	0.0073	0.071
Inhalation	0.0081	0.037	0.16
Mother's milk (mother on Diet 1)	0.00014	0.003	0.059
Prenatal exposure (mother on Diet 1)	0.0013	0.0089	0.076
Diet 1	0.46	3.1	20
Diet 2	0.18	1.2	7.5
Diet 3	0.2	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	6.1E-05	9.2E-04	1.5E-02
Diet 2	3.0E-05	3.6E-04	4.6E-03
Diet 3	3.4E-05	3.7E-04	4.7E-03
Diet 4	1.7E-04	2.5E-03	3.8E-02

Relative Risk [ ]			
Diet 1	1.023	1.24	3.5
Diet 2	1.0084	1.093	2.1
Diet 3	1.0098	1.096	2.2
Diet 4	1.052	1.58	10.6

Probability of Causation [%]			
Diet 1	2.27	19.2	72
Diet 2	0.84	8.5	52
Diet 3	0.98	8.8	55
Diet 4	4.93	36.6	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.4	2.8	17
Commercial Milk (locally produced)	0.12	0.93	5.9
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	0.83	7.1	76
Beef (locally produced)	0.00058	0.01	0.23
Leafy Vegetables (locally produced)	0.00011	0.0013	0.012
Eggs (locally produced)	0.023	0.17	1.3
Cottage Cheese (locally produced)	0.00055	0.0075	0.082
Inhalation	0.0082	0.037	0.15
Mother's milk (mother on Diet 1)	0.00014	0.003	0.059
Prenatal exposure (mother on Diet 1)	0.0013	0.0089	0.076
Diet 1	0.46	3	19
Diet 2	0.18	1.2	7.3
Diet 3	0.2	1.3	9.1

Excess Lifetime Risk [ ]			
Diet 1	8.4E-06	2.4E-04	4.6E-03
Diet 2	3.6E-06	8.9E-05	1.9E-03
Diet 3	4.1E-06	9.4E-05	2.0E-03
Diet 4	1.9E-05	5.8E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.0092	1.16	4.8
Diet 2	1.0033	1.062	2.3
Diet 3	1.0036	1.065	2.7
Diet 4	1.024	1.44	11

Probability of Causation [%]			
Diet 1	0.92	14.1	79
Diet 2	0.33	5.9	57
Diet 3	0.36	6.1	63
Diet 4	2.32	30.6	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.11	0.79	5.4
Commercial Milk (locally produced)	0.032	0.25	2
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	0.25	2.1	19
Beef (locally produced)	0.00016	0.0028	0.07
Leafy Vegetables (locally produced)	0.00003	0.00037	0.0037
Eggs (locally produced)	0.005	0.045	0.38
Cottage Cheese (locally produced)	0.00013	0.0019	0.023
Inhalation	0.0019	0.0085	0.042
Mother's milk (mother on Diet 1)	0.000036	0.00079	0.016
Prenatal exposure (mother on Diet 1)	0.00033	0.0023	0.024
Diet 1	0.12	0.86	5.7
Diet 2	0.048	0.33	2.4
Diet 3	0.18	1.3	8

Excess Lifetime Risk [ ]			
Diet 1	1.3E-05	2.6E-04	4.8E-03
Diet 2	7.6E-06	9.5E-05	1.4E-03
Diet 3	3.3E-05	3.6E-04	4.7E-03
Diet 4	3.4E-05	6.2E-04	1.1E-02

Relative Risk [ ]			
Diet 1	1.006	1.063	1.76
Diet 2	1.0022	1.024	1.36
Diet 3	1.0092	1.093	2.2
Diet 4	1.014	1.16	3.7

Probability of Causation [%]			
Diet 1	0.60	5.9	43
Diet 2	0.22	2.3	26
Diet 3	0.91	8.5	55
Diet 4	1.35	13.7	73

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**  
**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.11	0.75	5.2
Commercial Milk (locally produced)	0.035	0.25	1.9
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	0.22	2.1	20
Beef (locally produced)	0.00016	0.0028	0.072
Leafy Vegetables (locally produced)	0.00003	0.00035	0.004
Eggs (locally produced)	0.0053	0.047	0.36
Cottage Cheese (locally produced)	0.00014	0.0021	0.021
Inhalation	0.002	0.0086	0.037
Mother's milk (mother on Diet 1)	0.000036	0.00079	0.016
Prenatal exposure (mother on Diet 1)	0.00033	0.0023	0.024
Diet 1	0.13	0.82	5.7
Diet 2	0.05	0.32	2.5
Diet 3	0.19	1.3	9

Excess Lifetime Risk [ ]			
Diet 1	1.8E-06	7.0E-05	1.3E-03
Diet 2	9.4E-07	2.5E-05	5.3E-04
Diet 3	3.9E-06	9.1E-05	2.0E-03
Diet 4	5.0E-06	1.6E-04	4.2E-03

Relative Risk [ ]			
Diet 1	1.002	1.043	1.94
Diet 2	1.0008	1.016	1.45
Diet 3	1.0035	1.064	2.7
Diet 4	1.0048	1.12	4.2

Probability of Causation [%]			
Diet 1	0.20	4.1	48
Diet 2	0.08	1.6	31
Diet 3	0.35	6.0	63
Diet 4	0.48	10.6	76

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.5	3.2	22
Commercial Milk (locally produced)	0.15	1.1	7.4
Commercial Milk (regionally mixed)	0.18	1.3	8
Goat Milk (locally produced)	1.1	8.4	72
Beef (locally produced)	0.0007	0.012	0.28
Leafy Vegetables (locally produced)	0.00013	0.0015	0.015
Eggs (locally produced)	0.024	0.19	1.5
Cottage Cheese (locally produced)	0.00063	0.0083	0.087
Inhalation	0.009	0.037	0.16
Mother's milk (mother on Diet 1)	0.00016	0.0033	0.054
Prenatal exposure (mother on Diet 1)	0.0015	0.0097	0.083
Diet 1	0.57	3.5	24
Diet 2	0.22	1.4	9
Diet 3	0.2	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	6.6E-05	1.1E-03	1.7E-02
Diet 2	3.2E-05	4.1E-04	5.5E-03
Diet 3	3.4E-05	3.7E-04	4.7E-03
Diet 4	1.5E-04	2.9E-03	4.0E-02

Relative Risk [ ]			
Diet 1	1.028	1.26	3.7
Diet 2	1.0099	1.1	2.2
Diet 3	1.0099	1.096	2.2
Diet 4	1.057	1.62	10.6

Probability of Causation [%]			
Diet 1	2.69	20.3	72
Diet 2	0.98	9.1	53
Diet 3	0.98	8.8	55
Diet 4	5.36	37.3	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.5	3.1	20
Commercial Milk (locally produced)	0.15	1	8.1
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	0.99	8.3	77
Beef (locally produced)	0.00068	0.012	0.28
Leafy Vegetables (locally produced)	0.00014	0.0015	0.015
Eggs (locally produced)	0.026	0.19	1.4
Cottage Cheese (locally produced)	0.00062	0.0084	0.091
Inhalation	0.0089	0.038	0.15
Mother's milk (mother on Diet 1)	0.00016	0.0033	0.054
Prenatal exposure (mother on Diet 1)	0.0015	0.0097	0.083
Diet 1	0.56	3.4	22
Diet 2	0.22	1.4	9.3
Diet 3	0.19	1.3	9.1

Excess Lifetime Risk [ ]			
Diet 1	9.4E-06	2.8E-04	5.1E-03
Diet 2	4.3E-06	1.0E-04	2.2E-03
Diet 3	4.1E-06	9.4E-05	2.0E-03
Diet 4	2.4E-05	6.7E-04	1.4E-02

Relative Risk [ ]			
Diet 1	1.0099	1.18	5.2
Diet 2	1.0037	1.069	2.7
Diet 3	1.0036	1.066	2.7
Diet 4	1.025	1.51	13

Probability of Causation [%]			
Diet 1	0.98	15.2	80
Diet 2	0.37	6.4	62
Diet 3	0.36	6.2	63
Diet 4	2.45	32.9	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.46	3	18
Commercial Milk (locally produced)	0.13	0.96	6.8
Commercial Milk (regionally mixed)	0.18	1.3	8
Goat Milk (locally produced)	0.95	7.9	70
Beef (locally produced)	0.0006	0.011	0.24
Leafy Vegetables (locally produced)	0.00012	0.0014	0.013
Eggs (locally produced)	0.022	0.17	1.4
Cottage Cheese (locally produced)	0.00051	0.0075	0.077
Inhalation	0.0087	0.037	0.16
Mother's milk (mother on Diet 1)	0.00014	0.0031	0.059
Prenatal exposure (mother on Diet 1)	0.0015	0.0094	0.08
Diet 1	0.52	3.3	20
Diet 2	0.2	1.2	8.3
Diet 3	0.2	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	5.6E-05	9.6E-04	1.6E-02
Diet 2	3.1E-05	3.7E-04	5.3E-03
Diet 3	3.4E-05	3.7E-04	4.7E-03
Diet 4	1.6E-04	2.5E-03	4.2E-02

Relative Risk [ ]			
Diet 1	1.025	1.25	3.6
Diet 2	1.0088	1.094	2.2
Diet 3	1.0099	1.096	2.2
Diet 4	1.056	1.6	9.8

Probability of Causation [%]			
Diet 1	2.47	19.8	72
Diet 2	0.87	8.6	54
Diet 3	0.98	8.8	55
Diet 4	5.27	37.3	89

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.47	3	17
Commercial Milk (locally produced)	0.14	0.97	6.4
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	0.9	7.6	74
Beef (locally produced)	0.00058	0.01	0.24
Leafy Vegetables (locally produced)	0.00013	0.0014	0.014
Eggs (locally produced)	0.023	0.18	1.2
Cottage Cheese (locally produced)	0.00058	0.0079	0.08
Inhalation	0.009	0.038	0.16
Mother's milk (mother on Diet 1)	0.00014	0.0031	0.059
Prenatal exposure (mother on Diet 1)	0.0015	0.0094	0.08
Diet 1	0.52	3.2	19
Diet 2	0.2	1.3	7.9
Diet 3	0.19	1.3	9.1

Excess Lifetime Risk [ ]			
Diet 1	7.8E-06	2.6E-04	4.4E-03
Diet 2	3.6E-06	9.7E-05	2.0E-03
Diet 3	4.1E-06	9.4E-05	2.0E-03
Diet 4	2.0E-05	6.2E-04	1.3E-02

Relative Risk [ ]			
Diet 1	1.0088	1.17	4.5
Diet 2	1.0034	1.063	2.5
Diet 3	1.0036	1.065	2.7
Diet 4	1.023	1.46	12

Probability of Causation [%]			
Diet 1	0.87	14.3	77
Diet 2	0.34	5.9	60
Diet 3	0.36	6.1	64
Diet 4	2.27	31.4	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.52	3.3	22
Commercial Milk (locally produced)	0.16	1.1	8.1
Commercial Milk (regionally mixed)	0.18	1.3	8
Goat Milk (locally produced)	1.1	8.7	77
Beef (locally produced)	0.00073	0.012	0.28
Leafy Vegetables (locally produced)	0.00013	0.0016	0.015
Eggs (locally produced)	0.025	0.2	1.6
Cottage Cheese (locally produced)	0.00057	0.0087	0.096
Inhalation	0.01	0.043	0.19
Mother's milk (mother on Diet 1)	0.00017	0.0036	0.064
Prenatal exposure (mother on Diet 1)	0.0017	0.011	0.087
Diet 1	0.57	3.6	24
Diet 2	0.23	1.4	9.7
Diet 3	0.2	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	6.7E-05	1.1E-03	2.1E-02
Diet 2	3.5E-05	4.4E-04	5.6E-03
Diet 3	3.4E-05	3.7E-04	4.7E-03
Diet 4	1.7E-04	3.0E-03	4.2E-02

Relative Risk [ ]			
Diet 1	1.028	1.27	3.8
Diet 2	1.01	1.1	2.1
Diet 3	1.01	1.096	2.2
Diet 4	1.063	1.68	11

Probability of Causation [%]			
Diet 1	2.75	21.5	74
Diet 2	1.03	9.5	52
Diet 3	1.00	8.8	55
Diet 4	5.95	40.3	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.52	3.3	20
Commercial Milk (locally produced)	0.15	1.1	7.6
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	1.1	8.8	81
Beef (locally produced)	0.00071	0.012	0.28
Leafy Vegetables (locally produced)	0.00014	0.0015	0.015
Eggs (locally produced)	0.027	0.2	1.4
Cottage Cheese (locally produced)	0.00064	0.0087	0.098
Inhalation	0.01	0.044	0.19
Mother's milk (mother on Diet 1)	0.00017	0.0036	0.064
Prenatal exposure (mother on Diet 1)	0.0017	0.011	0.087
Diet 1	0.57	3.6	22
Diet 2	0.23	1.5	9.2
Diet 3	0.19	1.3	9.1

Excess Lifetime Risk [ ]			
Diet 1	9.7E-06	3.0E-04	5.0E-03
Diet 2	4.4E-06	1.1E-04	2.2E-03
Diet 3	4.1E-06	9.5E-05	2.0E-03
Diet 4	2.2E-05	7.1E-04	1.5E-02

Relative Risk [ ]			
Diet 1	1.011	1.19	5.5
Diet 2	1.0039	1.074	2.8
Diet 3	1.0036	1.066	2.7
Diet 4	1.026	1.52	15

Probability of Causation [%]			
Diet 1	1.05	16.2	82
Diet 2	0.39	6.9	64
Diet 3	0.36	6.2	64
Diet 4	2.52	34.4	93

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.29	1.8	14
Commercial Milk (locally produced)	0.079	0.58	4.5
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	0.61	5	44
Beef (locally produced)	0.00038	0.007	0.17
Leafy Vegetables (locally produced)	0.000079	0.00084	0.0085
Eggs (locally produced)	0.014	0.1	0.83
Cottage Cheese (locally produced)	0.00035	0.0047	0.057
Inhalation	0.006	0.025	0.11
Mother's milk (mother on Diet 1)	0.00011	0.002	0.036
Prenatal exposure (mother on Diet 1)	0.00092	0.0061	0.054
Diet 1	0.32	2	15
Diet 2	0.12	0.78	5.6
Diet 3	0.19	1.3	8

	Excess Lifetime Risk [ ]		
Diet 1	3.8E-05	6.1E-04	1.0E-02
Diet 2	1.9E-05	2.3E-04	3.2E-03
Diet 3	3.3E-05	3.7E-04	4.7E-03
Diet 4	9.9E-05	1.5E-03	3.0E-02

	Relative Risk [ ]		
Diet 1	1.016	1.15	2.9
Diet 2	1.0058	1.059	1.74
Diet 3	1.0095	1.095	2.2
Diet 4	1.032	1.35	7.7

	Probability of Causation [%]		
Diet 1	1.58	12.8	65
Diet 2	0.58	5.6	42
Diet 3	0.94	8.7	55
Diet 4	3.12	25.7	87

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.3	1.8	13
Commercial Milk (locally produced)	0.081	0.58	4.2
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	0.55	4.7	49
Beef (locally produced)	0.00038	0.0069	0.16
Leafy Vegetables (locally produced)	0.000081	0.00081	0.0093
Eggs (locally produced)	0.015	0.11	0.87
Cottage Cheese (locally produced)	0.00037	0.0045	0.059
Inhalation	0.0062	0.025	0.11
Mother's milk (mother on Diet 1)	0.00011	0.002	0.036
Prenatal exposure (mother on Diet 1)	0.00092	0.0061	0.054
Diet 1	0.35	2	14
Diet 2	0.12	0.78	5.4
Diet 3	0.19	1.3	9.1

Excess Lifetime Risk [ ]			
Diet 1	5.0E-06	1.5E-04	3.0E-03
Diet 2	2.3E-06	5.8E-05	1.2E-03
Diet 3	4.0E-06	9.2E-05	2.0E-03
Diet 4	1.4E-05	4.0E-04	8.5E-03

Relative Risk [ ]			
Diet 1	1.0055	1.11	3.5
Diet 2	1.002	1.04	1.99
Diet 3	1.0036	1.065	2.7
Diet 4	1.013	1.28	7.2

Probability of Causation [%]			
Diet 1	0.54	9.8	71
Diet 2	0.20	3.8	50
Diet 3	0.36	6.1	63
Diet 4	1.25	22.1	86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.46	2.9	19
Commercial Milk (locally produced)	0.13	0.93	6.5
Commercial Milk (regionally mixed)	0.18	1.3	8
Goat Milk (locally produced)	0.93	7.5	65
Beef (locally produced)	0.00059	0.011	0.23
Leafy Vegetables (locally produced)	0.00011	0.0014	0.013
Eggs (locally produced)	0.022	0.16	1.2
Cottage Cheese (locally produced)	0.00052	0.0073	0.081
Inhalation	0.0094	0.037	0.16
Mother's milk (mother on Diet 1)	0.00014	0.0031	0.054
Prenatal exposure (mother on Diet 1)	0.0014	0.0093	0.075
Diet 1	0.52	3.2	21
Diet 2	0.2	1.2	8.3
Diet 3	0.2	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	5.9E-05	9.6E-04	1.4E-02
Diet 2	3.0E-05	3.7E-04	4.8E-03
Diet 3	3.4E-05	3.7E-04	4.7E-03
Diet 4	1.5E-04	2.5E-03	3.9E-02

Relative Risk [ ]			
Diet 1	1.024	1.24	3.7
Diet 2	1.009	1.092	2.1
Diet 3	1.0098	1.096	2.2
Diet 4	1.054	1.56	10

Probability of Causation [%]			
Diet 1	2.36	19.2	72
Diet 2	0.89	8.4	51
Diet 3	0.97	8.8	55
Diet 4	5.09	35.5	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.47	2.8	18
Commercial Milk (locally produced)	0.14	0.95	6.5
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	0.87	7.6	68
Beef (locally produced)	0.0006	0.011	0.24
Leafy Vegetables (locally produced)	0.00011	0.0013	0.013
Eggs (locally produced)	0.024	0.17	1.2
Cottage Cheese (locally produced)	0.00057	0.0073	0.088
Inhalation	0.0098	0.037	0.15
Mother's milk (mother on Diet 1)	0.00014	0.0031	0.054
Prenatal exposure (mother on Diet 1)	0.0014	0.0093	0.075
Diet 1	0.53	3.1	20
Diet 2	0.21	1.2	8
Diet 3	0.2	1.3	9.1

Excess Lifetime Risk [ ]			
Diet 1	8.1E-06	2.5E-04	4.8E-03
Diet 2	4.1E-06	9.4E-05	2.0E-03
Diet 3	4.1E-06	9.4E-05	2.0E-03
Diet 4	2.3E-05	6.2E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.0091	1.17	4.6
Diet 2	1.0032	1.063	2.5
Diet 3	1.0037	1.066	2.7
Diet 4	1.022	1.45	10.3

Probability of Causation [%]			
Diet 1	0.90	14.3	78
Diet 2	0.32	5.9	59
Diet 3	0.37	6.2	63
Diet 4	2.13	31.0	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.29	1.8	11
Commercial Milk (locally produced)	0.086	0.58	4.1
Commercial Milk (regionally mixed)	0.18	1.3	8
Goat Milk (locally produced)	0.63	4.7	40
Beef (locally produced)	0.00036	0.0066	0.16
Leafy Vegetables (locally produced)	0.000079	0.00084	0.0078
Eggs (locally produced)	0.013	0.1	0.83
Cottage Cheese (locally produced)	0.00031	0.0043	0.048
Inhalation	0.0047	0.02	0.089
Mother's milk (mother on Diet 1)	0.000083	0.0019	0.035
Prenatal exposure (mother on Diet 1)	0.00084	0.0055	0.049
Diet 1	0.34	1.9	12
Diet 2	0.13	0.75	5
Diet 3	0.19	1.3	8

Excess Lifetime Risk [ ]			
Diet 1	3.5E-05	5.9E-04	8.7E-03
Diet 2	1.9E-05	2.2E-04	3.0E-03
Diet 3	3.3E-05	3.7E-04	4.7E-03
Diet 4	8.8E-05	1.6E-03	2.4E-02

Relative Risk [ ]			
Diet 1	1.015	1.15	2.6
Diet 2	1.0056	1.055	1.74
Diet 3	1.0095	1.094	2.2
Diet 4	1.032	1.35	6.5

Probability of Causation [%]			
Diet 1	1.44	12.7	61
Diet 2	0.56	5.2	42
Diet 3	0.94	8.6	55
Diet 4	3.13	25.8	84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**  
**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.3	1.7	10
Commercial Milk (locally produced)	0.086	0.57	4.2
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	0.58	4.6	42
Beef (locally produced)	0.00036	0.0065	0.15
Leafy Vegetables (locally produced)	0.00008	0.00082	0.0079
Eggs (locally produced)	0.014	0.11	0.75
Cottage Cheese (locally produced)	0.00038	0.0047	0.049
Inhalation	0.0051	0.021	0.083
Mother's milk (mother on Diet 1)	0.000083	0.0019	0.035
Prenatal exposure (mother on Diet 1)	0.00084	0.0055	0.049
Diet 1	0.34	1.9	11
Diet 2	0.13	0.74	5.1
Diet 3	0.19	1.3	9

Excess Lifetime Risk [ ]			
Diet 1	4.6E-06	1.5E-04	2.7E-03
Diet 2	2.6E-06	5.9E-05	1.3E-03
Diet 3	4.0E-06	9.2E-05	2.0E-03
Diet 4	1.3E-05	3.7E-04	8.2E-03

Relative Risk [ ]			
Diet 1	1.0054	1.1	3.1
Diet 2	1.0021	1.039	1.93
Diet 3	1.0036	1.065	2.7
Diet 4	1.013	1.27	7.5

Probability of Causation [%]			
Diet 1	0.54	9.1	67
Diet 2	0.21	3.8	48
Diet 3	0.35	6.1	63
Diet 4	1.29	21.4	86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.33	2.2	13
Commercial Milk (locally produced)	0.092	0.72	5.1
Commercial Milk (regionally mixed)	0.18	1.3	8
Goat Milk (locally produced)	0.64	5.7	55
Beef (locally produced)	0.00042	0.008	0.17
Leafy Vegetables (locally produced)	0.000093	0.001	0.0098
Eggs (locally produced)	0.016	0.13	0.97
Cottage Cheese (locally produced)	0.0004	0.0057	0.056
Inhalation	0.0066	0.029	0.13
Mother's milk (mother on Diet 1)	0.000097	0.0023	0.049
Prenatal exposure (mother on Diet 1)	0.0011	0.0072	0.061
Diet 1	0.37	2.4	14
Diet 2	0.13	0.94	6.1
Diet 3	0.19	1.3	8

Excess Lifetime Risk [ ]			
Diet 1	4.2E-05	7.0E-04	1.2E-02
Diet 2	2.1E-05	2.8E-04	3.9E-03
Diet 3	3.3E-05	3.7E-04	4.7E-03
Diet 4	1.2E-04	1.9E-03	3.2E-02

Relative Risk [ ]			
Diet 1	1.02	1.18	2.9
Diet 2	1.0066	1.071	1.86
Diet 3	1.0097	1.096	2.2
Diet 4	1.042	1.45	8

Probability of Causation [%]			
Diet 1	1.92	15.3	65
Diet 2	0.66	6.6	46
Diet 3	0.96	8.7	55
Diet 4	4.01	31.0	87

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.31	2.2	13
Commercial Milk (locally produced)	0.098	0.72	4.4
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	0.61	5.6	57
Beef (locally produced)	0.00043	0.0077	0.17
Leafy Vegetables (locally produced)	0.000091	0.001	0.0099
Eggs (locally produced)	0.018	0.13	0.91
Cottage Cheese (locally produced)	0.00044	0.0058	0.057
Inhalation	0.0068	0.03	0.13
Mother's milk (mother on Diet 1)	0.000097	0.0023	0.049
Prenatal exposure (mother on Diet 1)	0.0011	0.0072	0.061
Diet 1	0.36	2.4	13
Diet 2	0.14	0.94	5.5
Diet 3	0.19	1.3	9

Excess Lifetime Risk [ ]			
Diet 1	6.0E-06	1.9E-04	3.3E-03
Diet 2	2.5E-06	7.0E-05	1.5E-03
Diet 3	4.0E-06	9.3E-05	2.0E-03
Diet 4	1.4E-05	4.4E-04	9.4E-03

Relative Risk [ ]			
Diet 1	1.0067	1.13	3.4
Diet 2	1.0025	1.048	2
Diet 3	1.0036	1.065	2.7
Diet 4	1.018	1.34	8.6

Probability of Causation [%]			
Diet 1	0.66	11.2	71
Diet 2	0.25	4.6	50
Diet 3	0.36	6.1	63
Diet 4	1.75	25.5	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.56	3.6	24
Commercial Milk (locally produced)	0.17	1.2	8.2
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	1.2	9.5	80
Beef (locally produced)	0.00074	0.013	0.3
Leafy Vegetables (locally produced)	0.00015	0.0017	0.017
Eggs (locally produced)	0.027	0.21	1.6
Cottage Cheese (locally produced)	0.00066	0.0089	0.099
Inhalation	0.012	0.047	0.2
Mother's milk (mother on Diet 1)	0.00017	0.0039	0.066
Prenatal exposure (mother on Diet 1)	0.0018	0.012	0.093
Diet 1	0.64	3.9	27
Diet 2	0.25	1.6	10
Diet 3	0.21	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	7.3E-05	1.2E-03	1.8E-02
Diet 2	3.5E-05	4.7E-04	6.3E-03
Diet 3	3.4E-05	3.7E-04	4.7E-03
Diet 4	1.8E-04	3.3E-03	4.7E-02

Relative Risk [ ]			
Diet 1	1.033	1.3	4.2
Diet 2	1.012	1.11	2.3
Diet 3	1.01	1.097	2.2
Diet 4	1.067	1.71	12

Probability of Causation [%]			
Diet 1	3.17	23.0	76
Diet 2	1.19	10.3	57
Diet 3	0.99	8.8	55
Diet 4	6.25	41.3	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.57	3.6	21
Commercial Milk (locally produced)	0.17	1.2	8.6
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	1.2	9.5	86
Beef (locally produced)	0.00078	0.013	0.3
Leafy Vegetables (locally produced)	0.00016	0.0017	0.017
Eggs (locally produced)	0.031	0.22	1.5
Cottage Cheese (locally produced)	0.00072	0.0094	0.11
Inhalation	0.012	0.047	0.19
Mother's milk (mother on Diet 1)	0.00017	0.0039	0.066
Prenatal exposure (mother on Diet 1)	0.0018	0.012	0.093
Diet 1	0.63	3.9	24
Diet 2	0.25	1.6	10
Diet 3	0.2	1.3	9.1

Excess Lifetime Risk [ ]			
Diet 1	9.7E-06	3.2E-04	5.6E-03
Diet 2	4.9E-06	1.2E-04	2.5E-03
Diet 3	4.1E-06	9.5E-05	2.0E-03
Diet 4	2.8E-05	8.1E-04	1.5E-02

Relative Risk [ ]			
Diet 1	1.013	1.21	5.5
Diet 2	1.0042	1.08	2.9
Diet 3	1.0037	1.066	2.8
Diet 4	1.029	1.57	13

Probability of Causation [%]			
Diet 1	1.27	17.6	81
Diet 2	0.42	7.4	66
Diet 3	0.37	6.2	64
Diet 4	2.78	36.3	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	1.8	12
Commercial Milk (locally produced)	0.075	0.58	4.5
Commercial Milk (regionally mixed)	0.17	1.2	8
Goat Milk (locally produced)	0.55	4.7	42
Beef (locally produced)	0.00039	0.0067	0.15
Leafy Vegetables (locally produced)	0.000068	0.00083	0.0074
Eggs (locally produced)	0.013	0.1	0.87
Cottage Cheese (locally produced)	0.00031	0.0046	0.052
Inhalation	0.0057	0.025	0.11
Mother's milk (mother on Diet 1)	0.0001	0.002	0.038
Prenatal exposure (mother on Diet 1)	0.00087	0.0059	0.05
Diet 1	0.32	1.9	13
Diet 2	0.12	0.74	5.4
Diet 3	0.19	1.3	8

Excess Lifetime Risk [ ]			
Diet 1	3.9E-05	6.1E-04	1.2E-02
Diet 2	1.8E-05	2.3E-04	3.3E-03
Diet 3	3.3E-05	3.7E-04	4.7E-03
Diet 4	8.1E-05	1.6E-03	2.4E-02

Relative Risk [ ]			
Diet 1	1.014	1.14	2.5
Diet 2	1.0056	1.055	1.67
Diet 3	1.0096	1.094	2.2
Diet 4	1.032	1.35	6.1

Probability of Causation [%]			
Diet 1	1.41	12.1	60
Diet 2	0.56	5.2	40
Diet 3	0.95	8.6	55
Diet 4	3.09	26.0	84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	1.7	12
Commercial Milk (locally produced)	0.083	0.58	4
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	0.57	4.8	43
Beef (locally produced)	0.00038	0.0066	0.15
Leafy Vegetables (locally produced)	0.000068	0.00083	0.0079
Eggs (locally produced)	0.014	0.1	0.77
Cottage Cheese (locally produced)	0.00034	0.0045	0.051
Inhalation	0.006	0.025	0.11
Mother's milk (mother on Diet 1)	0.0001	0.002	0.038
Prenatal exposure (mother on Diet 1)	0.00087	0.0059	0.05
Diet 1	0.31	1.9	12
Diet 2	0.12	0.76	5.2
Diet 3	0.19	1.3	9

Excess Lifetime Risk [ ]			
Diet 1	5.1E-06	1.5E-04	2.6E-03
Diet 2	2.6E-06	5.8E-05	1.2E-03
Diet 3	4.0E-06	9.3E-05	2.0E-03
Diet 4	1.2E-05	3.9E-04	7.8E-03

Relative Risk [ ]			
Diet 1	1.0058	1.11	3.2
Diet 2	1.002	1.04	1.92
Diet 3	1.0036	1.065	2.7
Diet 4	1.013	1.29	9

Probability of Causation [%]			
Diet 1	0.58	9.6	69
Diet 2	0.20	3.9	48
Diet 3	0.36	6.1	63
Diet 4	1.27	22.3	89

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**  
**Receptor: Female born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.53	3.3	22
Commercial Milk (locally produced)	0.16	1.1	7.6
Commercial Milk (regionally mixed)	0.17	1.3	8
Goat Milk (locally produced)	1.1	8.6	74
Beef (locally produced)	0.00069	0.012	0.28
Leafy Vegetables (locally produced)	0.00013	0.0016	0.014
Eggs (locally produced)	0.025	0.19	1.5
Cottage Cheese (locally produced)	0.00059	0.0083	0.093
Inhalation	0.011	0.04	0.17
Mother's milk (mother on Diet 1)	0.00016	0.0035	0.061
Prenatal exposure (mother on Diet 1)	0.0016	0.011	0.085
Diet 1	0.6	3.6	23
Diet 2	0.24	1.4	9.5
Diet 3	0.2	1.3	8.1

Excess Lifetime Risk [ ]			
Diet 1	7.0E-05	1.1E-03	1.6E-02
Diet 2	3.5E-05	4.3E-04	5.6E-03
Diet 3	3.4E-05	3.7E-04	4.7E-03
Diet 4	1.7E-04	3.0E-03	4.3E-02

Relative Risk [ ]			
Diet 1	1.029	1.27	4
Diet 2	1.011	1.1	2.2
Diet 3	1.01	1.096	2.2
Diet 4	1.064	1.65	10.7

Probability of Causation [%]			
Diet 1	2.79	21.4	75
Diet 2	1.07	9.5	55
Diet 3	0.99	8.8	55
Diet 4	5.99	39.3	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**

**Receptor: Male born in 1952**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.53	3.2	20
Commercial Milk (locally produced)	0.16	1.1	7.7
Commercial Milk (regionally mixed)	0.18	1.3	9
Goat Milk (locally produced)	1.1	8.8	81
Beef (locally produced)	0.00069	0.012	0.28
Leafy Vegetables (locally produced)	0.00014	0.0015	0.015
Eggs (locally produced)	0.029	0.2	1.4
Cottage Cheese (locally produced)	0.00066	0.0085	0.096
Inhalation	0.011	0.041	0.16
Mother's milk (mother on Diet 1)	0.00016	0.0035	0.061
Prenatal exposure (mother on Diet 1)	0.0016	0.011	0.085
Diet 1	0.6	3.6	22
Diet 2	0.25	1.4	9.4
Diet 3	0.2	1.3	9.1

Excess Lifetime Risk [ ]			
Diet 1	9.3E-06	2.9E-04	5.6E-03
Diet 2	4.8E-06	1.1E-04	2.3E-03
Diet 3	4.1E-06	9.5E-05	2.0E-03
Diet 4	2.6E-05	7.3E-04	1.4E-02

Relative Risk [ ]			
Diet 1	1.011	1.19	5.1
Diet 2	1.0038	1.074	2.7
Diet 3	1.0037	1.066	2.7
Diet 4	1.025	1.52	12

Probability of Causation [%]			
Diet 1	1.05	16.0	80
Diet 2	0.38	6.9	62
Diet 3	0.37	6.2	63
Diet 4	2.47	34.0	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.5	18	150
Commercial Milk (locally produced)	0.69	5.8	47
Commercial Milk (regionally mixed)	0.094	0.82	5.7
Goat Milk (locally produced)	4.7	51	540
Beef (locally produced)	0.0025	0.051	1.2
Leafy Vegetables (locally produced)	0.00079	0.0087	0.089
Eggs (locally produced)	0.11	0.97	8.1
Cottage Cheese (locally produced)	0.0028	0.048	0.62
Inhalation	0.029	0.12	0.54
Mother's milk (mother on Diet 1)	0.011	0.37	7.7
Prenatal exposure (mother on Diet 1)	0.099	1.2	8.9
Diet 1	2.8	19	160
Diet 2	1	7.6	57
Diet 3	0.15	0.96	6.2

Excess Lifetime Risk [ ]			
Diet 1	3.7E-04	6.4E-03	9.8E-02
Diet 2	1.4E-04	2.2E-03	3.0E-02
Diet 3	2.3E-05	2.8E-04	3.6E-03
Diet 4	7.7E-04	1.7E-02	3.0E-01

Relative Risk [ ]			
Diet 1	1.13	2.4	22
Diet 2	1.046	1.54	10.5
Diet 3	1.0071	1.069	2
Diet 4	1.3	5	67

Probability of Causation [%]			
Diet 1	11.59	58.6	95
Diet 2	4.38	35.0	90
Diet 3	0.71	6.5	50
Diet 4	23.18	79.7	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**  
**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	2.8	18	130
Commercial Milk (locally produced)	0.66	5.8	41
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	5.6	51	500
Beef (locally produced)	0.0025	0.05	1.1
Leafy Vegetables (locally produced)	0.00064	0.0086	0.098
Eggs (locally produced)	0.12	0.96	8
Cottage Cheese (locally produced)	0.0031	0.045	0.59
Inhalation	0.029	0.13	0.54
Mother's milk (mother on Diet 1)	0.011	0.37	7.7
Prenatal exposure (mother on Diet 1)	0.099	1.2	8.9
Diet 1	3	19	140
Diet 2	0.96	7.5	50
Diet 3	0.15	0.94	5.2

Excess Lifetime Risk [ ]			
Diet 1	5.1E-05	1.6E-03	3.0E-02
Diet 2	2.1E-05	5.7E-04	1.3E-02
Diet 3	3.0E-06	7.4E-05	1.6E-03
Diet 4	1.1E-04	4.3E-03	1.1E-01

Relative Risk [ ]			
Diet 1	1.061	2	26
Diet 2	1.02	1.4	10.5
Diet 3	1.0027	1.05	2
Diet 4	1.12	4	88

Probability of Causation [%]			
Diet 1	5.74	50.7	96
Diet 2	1.92	28.6	90
Diet 3	0.27	4.8	50
Diet 4	10.43	74.6	99

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.2	23	160
Commercial Milk (locally produced)	0.89	7.7	51
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	6	65	620
Beef (locally produced)	0.0031	0.062	1.4
Leafy Vegetables (locally produced)	0.00094	0.011	0.11
Eggs (locally produced)	0.14	1.1	9
Cottage Cheese (locally produced)	0.0035	0.059	0.66
Inhalation	0.031	0.15	0.67
Mother's milk (mother on Diet 1)	0.014	0.44	9.7
Prenatal exposure (mother on Diet 1)	0.13	1.5	10
Diet 1	3.5	25	180
Diet 2	1.3	9.5	60
Diet 3	0.16	0.99	6.2

Excess Lifetime Risk [ ]			
Diet 1	4.2E-04	7.5E-03	1.1E-01
Diet 2	1.9E-04	2.7E-03	4.1E-02
Diet 3	2.4E-05	2.9E-04	3.8E-03
Diet 4	9.2E-04	2.1E-02	3.7E-01

Relative Risk [ ]			
Diet 1	1.17	2.8	26
Diet 2	1.057	1.68	12
Diet 3	1.0078	1.072	2
Diet 4	1.34	6	81

Probability of Causation [%]			
Diet 1	14.61	64.0	96
Diet 2	5.41	40.4	91
Diet 3	0.77	6.7	51
Diet 4	25.33	83.2	99

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	3.5	22	160
Commercial Milk (locally produced)	0.83	7.5	51
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	6.9	67	630
Beef (locally produced)	0.0033	0.059	1.5
Leafy Vegetables (locally produced)	0.00077	0.01	0.11
Eggs (locally produced)	0.15	1.2	10
Cottage Cheese (locally produced)	0.0038	0.059	0.74
Inhalation	0.036	0.16	0.65
Mother's milk (mother on Diet 1)	0.014	0.44	9.7
Prenatal exposure (mother on Diet 1)	0.13	1.5	10
Diet 1	3.8	23	170
Diet 2	1.2	9.4	59
Diet 3	0.16	0.97	5.2

Excess Lifetime Risk [ ]			
Diet 1	6.4E-05	2.0E-03	3.6E-02
Diet 2	2.6E-05	7.4E-04	1.5E-02
Diet 3	3.2E-06	7.8E-05	1.6E-03
Diet 4	1.5E-04	5.4E-03	1.3E-01

Relative Risk [ ]			
Diet 1	1.072	2.2	30
Diet 2	1.024	1.5	11
Diet 3	1.0029	1.053	2
Diet 4	1.14	4.5	111

Probability of Causation [%]			
Diet 1	6.72	55.2	97
Diet 2	2.35	33.2	91
Diet 3	0.29	5.1	51
Diet 4	11.92	77.8	99

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.63	4.8	36
Commercial Milk (locally produced)	0.17	1.6	12
Commercial Milk (regionally mixed)	0.095	0.82	5.7
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.00066	0.013	0.31
Leafy Vegetables (locally produced)	0.00019	0.0023	0.024
Eggs (locally produced)	0.028	0.25	2.2
Cottage Cheese (locally produced)	0.00073	0.012	0.16
Inhalation	0.0076	0.034	0.14
Mother's milk (mother on Diet 1)	0.0028	0.095	2.1
Prenatal exposure (mother on Diet 1)	0.027	0.31	2.4
Diet 1	0.7	5.3	39
Diet 2	0.25	2	14
Diet 3	0.11	0.86	5.8

Excess Lifetime Risk [ ]			
Diet 1	9.7E-05	1.6E-03	2.4E-02
Diet 2	3.7E-05	5.7E-04	8.3E-03
Diet 3	1.6E-05	2.4E-04	3.3E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.031	1.37	6.5
Diet 2	1.012	1.14	3.3
Diet 3	1.0055	1.061	1.98
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	3.02	26.3	83
Diet 2	1.16	12.1	68
Diet 3	0.55	5.7	49
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.65	4.6	32
Commercial Milk (locally produced)	0.17	1.5	11
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.00065	0.013	0.31
Leafy Vegetables (locally produced)	0.00017	0.0022	0.025
Eggs (locally produced)	0.031	0.25	2.1
Cottage Cheese (locally produced)	0.00084	0.012	0.16
Inhalation	0.0074	0.034	0.14
Mother's milk (mother on Diet 1)	0.0028	0.095	2.1
Prenatal exposure (mother on Diet 1)	0.027	0.31	2.4
Diet 1	0.71	5	34
Diet 2	0.25	2	13
Diet 3	0.11	0.84	5

Excess Lifetime Risk [ ]			
Diet 1	1.2E-05	4.1E-04	7.6E-03
Diet 2	5.4E-06	1.5E-04	3.4E-03
Diet 3	2.3E-06	6.3E-05	1.5E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.015	1.26	7.3
Diet 2	1.0052	1.1	3.5
Diet 3	1.0023	1.045	1.96
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	1.51	20.4	85
Diet 2	0.52	9.1	70
Diet 3	0.23	4.3	49
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.7	13	100
Commercial Milk (locally produced)	0.49	4.2	32
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0018	0.036	0.79
Leafy Vegetables (locally produced)	0.00051	0.0062	0.065
Eggs (locally produced)	0.084	0.66	5.5
Cottage Cheese (locally produced)	0.0019	0.032	0.43
Inhalation	0.02	0.09	0.39
Mother's milk (mother on Diet 1)	0.0072	0.26	4.9
Prenatal exposure (mother on Diet 1)	0.074	0.83	6.4
Diet 1	1.9	14	110
Diet 2	0.69	5.3	37
Diet 3	0.13	0.91	6

Excess Lifetime Risk [ ]			
Diet 1	2.6E-04	4.2E-03	6.8E-02
Diet 2	9.4E-05	1.6E-03	2.2E-02
Diet 3	2.0E-05	2.7E-04	3.5E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.096	2	15
Diet 2	1.033	1.38	6.9
Diet 3	1.0066	1.066	2
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	8.75	50.0	93
Diet 2	3.17	27.4	85
Diet 3	0.65	6.2	50
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.9	12	87
Commercial Milk (locally produced)	0.48	4.2	29
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.0018	0.036	0.8
Leafy Vegetables (locally produced)	0.0005	0.0061	0.069
Eggs (locally produced)	0.088	0.66	5.8
Cottage Cheese (locally produced)	0.0022	0.032	0.46
Inhalation	0.02	0.091	0.39
Mother's milk (mother on Diet 1)	0.0072	0.26	4.9
Prenatal exposure (mother on Diet 1)	0.074	0.83	6.4
Diet 1	2	13	92
Diet 2	0.71	5.3	34
Diet 3	0.14	0.9	5.1

Excess Lifetime Risk [ ]			
Diet 1	3.7E-05	1.1E-03	2.3E-02
Diet 2	1.5E-05	4.2E-04	9.2E-03
Diet 3	2.8E-06	7.0E-05	1.6E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.041	1.74	16
Diet 2	1.014	1.28	7.4
Diet 3	1.0025	1.048	1.99
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	3.96	42.4	94
Diet 2	1.41	21.8	86
Diet 3	0.25	4.6	50
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.7	13	98
Commercial Milk (locally produced)	0.46	4.1	30
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	3.1	36	330
Beef (locally produced)	0.0017	0.035	0.74
Leafy Vegetables (locally produced)	0.0005	0.0062	0.063
Eggs (locally produced)	0.082	0.64	5.4
Cottage Cheese (locally produced)	0.0019	0.031	0.41
Inhalation	0.021	0.09	0.39
Mother's milk (mother on Diet 1)	0.0073	0.25	5
Prenatal exposure (mother on Diet 1)	0.074	0.82	6.1
Diet 1	1.9	14	110
Diet 2	0.68	5.2	36
Diet 3	0.13	0.91	6

Excess Lifetime Risk [ ]			
Diet 1	2.5E-04	4.3E-03	6.7E-02
Diet 2	8.9E-05	1.5E-03	2.2E-02
Diet 3	2.0E-05	2.7E-04	3.5E-03
Diet 4	5.0E-04	1.2E-02	2.0E-01

Relative Risk [ ]			
Diet 1	1.093	1.97	15
Diet 2	1.032	1.38	6.8
Diet 3	1.0066	1.066	2
Diet 4	1.22	3.8	45

Probability of Causation [%]			
Diet 1	8.52	49.0	93
Diet 2	3.11	27.2	85
Diet 3	0.66	6.2	50
Diet 4	17.95	73.0	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.8	12	84
Commercial Milk (locally produced)	0.46	4.1	27
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	3.8	37	350
Beef (locally produced)	0.0018	0.035	0.76
Leafy Vegetables (locally produced)	0.00048	0.006	0.066
Eggs (locally produced)	0.083	0.64	5.8
Cottage Cheese (locally produced)	0.0021	0.032	0.44
Inhalation	0.02	0.091	0.4
Mother's milk (mother on Diet 1)	0.0073	0.25	5
Prenatal exposure (mother on Diet 1)	0.074	0.82	6.1
Diet 1	2	13	89
Diet 2	0.69	5.3	33
Diet 3	0.14	0.9	5.1

Excess Lifetime Risk [ ]			
Diet 1	3.3E-05	1.1E-03	2.2E-02
Diet 2	1.4E-05	4.2E-04	9.1E-03
Diet 3	2.7E-06	7.0E-05	1.6E-03
Diet 4	7.8E-05	3.0E-03	7.4E-02

Relative Risk [ ]			
Diet 1	1.042	1.72	16
Diet 2	1.014	1.27	7.3
Diet 3	1.0025	1.048	1.99
Diet 4	1.082	3	62

Probability of Causation [%]			
Diet 1	4.02	41.5	93
Diet 2	1.43	21.4	86
Diet 3	0.25	4.6	50
Diet 4	7.54	66.6	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.24	1.7	14
Commercial Milk (locally produced)	0.062	0.58	5.2
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	0.48	5.2	56
Beef (locally produced)	0.00024	0.0052	0.12
Leafy Vegetables (locally produced)	0.000069	0.00091	0.0098
Eggs (locally produced)	0.01	0.09	0.83
Cottage Cheese (locally produced)	0.00029	0.0047	0.074
Inhalation	0.0031	0.013	0.067
Mother's milk (mother on Diet 1)	0.0011	0.037	0.8
Prenatal exposure (mother on Diet 1)	0.011	0.11	1.1
Diet 1	0.26	1.9	15
Diet 2	0.091	0.72	5.9
Diet 3	0.1	0.84	5.7

Excess Lifetime Risk [ ]			
Diet 1	3.4E-05	6.1E-04	9.2E-03
Diet 2	1.4E-05	2.1E-04	3.0E-03
Diet 3	1.4E-05	2.3E-04	3.2E-03
Diet 4	7.5E-05	1.7E-03	3.3E-02

Relative Risk [ ]			
Diet 1	1.013	1.14	3.2
Diet 2	1.0048	1.052	1.84
Diet 3	1.0051	1.059	1.96
Diet 4	1.03	1.39	8

Probability of Causation [%]			
Diet 1	1.29	12.2	68
Diet 2	0.48	4.9	45
Diet 3	0.51	5.6	49
Diet 4	2.92	28.1	87

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.24	1.7	13
Commercial Milk (locally produced)	0.061	0.58	4.3
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.5	5.2	56
Beef (locally produced)	0.00023	0.0051	0.12
Leafy Vegetables (locally produced)	0.000066	0.00083	0.01
Eggs (locally produced)	0.011	0.095	0.89
Cottage Cheese (locally produced)	0.0003	0.0046	0.069
Inhalation	0.0032	0.013	0.066
Mother's milk (mother on Diet 1)	0.0011	0.037	0.8
Prenatal exposure (mother on Diet 1)	0.011	0.11	1.1
Diet 1	0.27	1.9	14
Diet 2	0.09	0.73	5.4
Diet 3	0.11	0.82	5

Excess Lifetime Risk [ ]			
Diet 1	4.3E-06	1.5E-04	3.3E-03
Diet 2	2.0E-06	6.0E-05	1.3E-03
Diet 3	2.2E-06	6.1E-05	1.5E-03
Diet 4	9.8E-06	4.5E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.0056	1.11	3.4
Diet 2	1.0019	1.04	1.94
Diet 3	1.0023	1.044	1.95
Diet 4	1.011	1.29	10.1

Probability of Causation [%]			
Diet 1	0.56	9.6	70
Diet 2	0.19	3.8	48
Diet 3	0.23	4.2	49
Diet 4	1.04	22.4	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0015	0.024	0.3
Inhalation	0.015	0.067	0.3
Mother's milk (mother on Diet 3)	0.00084	0.017	0.26
Prenatal exposure (mother on Diet 3)	0.0086	0.051	0.39
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.13	0.89	5.9

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.8E-05	2.6E-04	3.4E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0061	1.064	1.99
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.61	6.0	50
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0015	0.025	0.32
Inhalation	0.016	0.069	0.29
Mother's milk (mother on Diet 3)	0.00084	0.017	0.26
Prenatal exposure (mother on Diet 3)	0.0086	0.051	0.39
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.12	0.88	5.1

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.6E-06	6.8E-05	1.6E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0024	1.047	1.98
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.24	4.5	49
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.8	12	84
Commercial Milk (locally produced)	0.49	3.8	30
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	3	35	330
Beef (locally produced)	0.0016	0.034	0.79
Leafy Vegetables (locally produced)	0.00054	0.0059	0.061
Eggs (locally produced)	0.076	0.6	5
Cottage Cheese (locally produced)	0.0019	0.031	0.37
Inhalation	0.019	0.088	0.38
Mother's milk (mother on Diet 1)	0.0074	0.23	5.3
Prenatal exposure (mother on Diet 1)	0.074	0.78	5.8
Diet 1	2	13	91
Diet 2	0.69	4.8	36
Diet 3	0.13	0.9	6

Excess Lifetime Risk [ ]			
Diet 1	2.5E-04	4.1E-03	6.1E-02
Diet 2	9.1E-05	1.4E-03	2.1E-02
Diet 3	2.1E-05	2.7E-04	3.5E-03
Diet 4	4.9E-04	1.1E-02	2.2E-01

Relative Risk [ ]			
Diet 1	1.085	1.95	15
Diet 2	1.033	1.35	6.6
Diet 3	1.0065	1.066	2
Diet 4	1.2	3.7	45

Probability of Causation [%]			
Diet 1	7.81	48.7	93
Diet 2	3.16	25.8	85
Diet 3	0.65	6.2	50
Diet 4	16.81	72.7	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.9	12	79
Commercial Milk (locally produced)	0.44	3.8	25
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	3.4	34	320
Beef (locally produced)	0.0018	0.034	0.71
Leafy Vegetables (locally produced)	0.00047	0.0057	0.056
Eggs (locally produced)	0.079	0.64	5.1
Cottage Cheese (locally produced)	0.0021	0.031	0.39
Inhalation	0.021	0.089	0.38
Mother's milk (mother on Diet 1)	0.0074	0.23	5.3
Prenatal exposure (mother on Diet 1)	0.074	0.78	5.8
Diet 1	2.1	12	84
Diet 2	0.65	5	32
Diet 3	0.13	0.89	5.1

Excess Lifetime Risk [ ]			
Diet 1	3.2E-05	1.0E-03	1.9E-02
Diet 2	1.3E-05	3.9E-04	9.4E-03
Diet 3	2.7E-06	7.0E-05	1.6E-03
Diet 4	7.4E-05	2.8E-03	7.4E-02

Relative Risk [ ]			
Diet 1	1.039	1.66	15
Diet 2	1.014	1.25	6.9
Diet 3	1.0025	1.049	1.99
Diet 4	1.073	2.9	59

Probability of Causation [%]			
Diet 1	3.80	39.7	93
Diet 2	1.40	20.1	85
Diet 3	0.25	4.6	50
Diet 4	6.83	65.7	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.3	2.4	20
Commercial Milk (locally produced)	0.088	0.79	7.1
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	0.65	7	75
Beef (locally produced)	0.00038	0.0065	0.15
Leafy Vegetables (locally produced)	0.000096	0.0012	0.012
Eggs (locally produced)	0.013	0.12	1.2
Cottage Cheese (locally produced)	0.00042	0.0059	0.09
Inhalation	0.0041	0.018	0.095
Mother's milk (mother on Diet 1)	0.0013	0.049	1.1
Prenatal exposure (mother on Diet 1)	0.013	0.16	1.3
Diet 1	0.34	2.5	22
Diet 2	0.12	0.98	8.4
Diet 3	0.1	0.84	5.7

Excess Lifetime Risk [ ]			
Diet 1	4.9E-05	8.2E-04	1.3E-02
Diet 2	1.6E-05	3.1E-04	4.4E-03
Diet 3	1.4E-05	2.4E-04	3.3E-03
Diet 4	1.1E-04	2.4E-03	4.5E-02

Relative Risk [ ]			
Diet 1	1.02	1.19	4.2
Diet 2	1.0069	1.071	2.2
Diet 3	1.0053	1.059	1.97
Diet 4	1.041	1.51	9.8

Probability of Causation [%]			
Diet 1	1.93	15.7	75
Diet 2	0.68	6.6	54
Diet 3	0.53	5.6	49
Diet 4	3.97	33.9	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.34	2.3	18
Commercial Milk (locally produced)	0.087	0.79	6.5
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.73	6.9	77
Beef (locally produced)	0.00038	0.0064	0.15
Leafy Vegetables (locally produced)	0.000089	0.0011	0.014
Eggs (locally produced)	0.015	0.13	1.1
Cottage Cheese (locally produced)	0.00042	0.0063	0.093
Inhalation	0.0044	0.018	0.086
Mother's milk (mother on Diet 1)	0.0013	0.049	1.1
Prenatal exposure (mother on Diet 1)	0.013	0.16	1.3
Diet 1	0.37	2.5	19
Diet 2	0.12	0.99	8
Diet 3	0.11	0.82	5

Excess Lifetime Risk [ ]			
Diet 1	6.3E-06	2.1E-04	4.1E-03
Diet 2	2.7E-06	8.1E-05	1.7E-03
Diet 3	2.2E-06	6.2E-05	1.5E-03
Diet 4	1.5E-05	6.0E-04	1.6E-02

Relative Risk [ ]			
Diet 1	1.0077	1.15	4.5
Diet 2	1.0027	1.055	2.3
Diet 3	1.0023	1.044	1.95
Diet 4	1.016	1.39	13

Probability of Causation [%]			
Diet 1	0.76	12.7	77
Diet 2	0.27	5.2	55
Diet 3	0.23	4.2	49
Diet 4	1.56	28.1	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.095	0.81	5.7
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.00073	0.014	0.18
Inhalation	0.0084	0.039	0.19
Mother's milk (mother on Diet 3)	0.00064	0.014	0.25
Prenatal exposure (mother on Diet 3)	0.0069	0.043	0.35
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.11	0.86	5.8

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.6E-05	2.5E-04	3.3E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0056	1.061	1.98
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.56	5.8	49
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.00092	0.014	0.16
Inhalation	0.0095	0.039	0.17
Mother's milk (mother on Diet 3)	0.00064	0.014	0.25
Prenatal exposure (mother on Diet 3)	0.0069	0.043	0.35
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.12	0.85	5

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.4E-06	6.5E-05	1.5E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0024	1.045	1.96
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.24	4.3	49
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.3	2.3	20
Commercial Milk (locally produced)	0.089	0.75	7
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	0.58	6.9	72
Beef (locally produced)	0.00031	0.0063	0.18
Leafy Vegetables (locally produced)	0.0001	0.0011	0.012
Eggs (locally produced)	0.013	0.12	1.1
Cottage Cheese (locally produced)	0.00038	0.0059	0.097
Inhalation	0.0039	0.018	0.085
Mother's milk (mother on Diet 1)	0.0013	0.048	0.94
Prenatal exposure (mother on Diet 1)	0.013	0.15	1.2
Diet 1	0.33	2.5	23
Diet 2	0.13	0.92	8.2
Diet 3	0.1	0.84	5.7

Excess Lifetime Risk [ ]			
Diet 1	4.0E-05	7.7E-04	1.4E-02
Diet 2	1.9E-05	2.9E-04	4.6E-03
Diet 3	1.4E-05	2.4E-04	3.2E-03
Diet 4	1.0E-04	2.3E-03	4.2E-02

Relative Risk [ ]			
Diet 1	1.016	1.19	3.6
Diet 2	1.0059	1.069	2.2
Diet 3	1.0053	1.059	1.97
Diet 4	1.04	1.5	10.2

Probability of Causation [%]			
Diet 1	1.62	16.3	72
Diet 2	0.58	6.4	54
Diet 3	0.52	5.6	49
Diet 4	3.88	33.4	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.33	2.2	18
Commercial Milk (locally produced)	0.087	0.72	7.2
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.67	6.8	73
Beef (locally produced)	0.00034	0.0062	0.16
Leafy Vegetables (locally produced)	0.000094	0.0011	0.012
Eggs (locally produced)	0.014	0.12	1.3
Cottage Cheese (locally produced)	0.0004	0.006	0.083
Inhalation	0.0037	0.018	0.077
Mother's milk (mother on Diet 1)	0.0013	0.048	0.94
Prenatal exposure (mother on Diet 1)	0.013	0.15	1.2
Diet 1	0.36	2.4	19
Diet 2	0.13	0.94	8.1
Diet 3	0.11	0.82	5

Excess Lifetime Risk [ ]			
Diet 1	6.3E-06	1.8E-04	3.9E-03
Diet 2	2.4E-06	7.1E-05	1.8E-03
Diet 3	2.2E-06	6.1E-05	1.5E-03
Diet 4	1.3E-05	5.7E-04	1.4E-02

Relative Risk [ ]			
Diet 1	1.0066	1.13	4.4
Diet 2	1.0027	1.051	2.5
Diet 3	1.0022	1.044	1.95
Diet 4	1.015	1.36	12

Probability of Causation [%]			
Diet 1	0.65	11.7	77
Diet 2	0.27	4.8	59
Diet 3	0.22	4.2	49
Diet 4	1.45	26.6	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0012	0.02	0.26
Inhalation	0.013	0.06	0.26
Mother's milk (mother on Diet 3)	0.00079	0.017	0.26
Prenatal exposure (mother on Diet 3)	0.0087	0.049	0.37
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.12	0.88	5.9

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.8E-05	2.6E-04	3.4E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.006	1.063	1.99
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.60	5.9	50
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0014	0.021	0.25
Inhalation	0.014	0.06	0.25
Mother's milk (mother on Diet 3)	0.00079	0.017	0.26
Prenatal exposure (mother on Diet 3)	0.0087	0.049	0.37
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.12	0.87	5.1

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.5E-06	6.7E-05	1.5E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0024	1.047	1.97
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.24	4.5	49
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.6	11	87
Commercial Milk (locally produced)	0.42	3.7	28
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	2.9	32	300
Beef (locally produced)	0.0017	0.032	0.66
Leafy Vegetables (locally produced)	0.00048	0.0055	0.056
Eggs (locally produced)	0.071	0.58	4.8
Cottage Cheese (locally produced)	0.002	0.028	0.35
Inhalation	0.019	0.085	0.41
Mother's milk (mother on Diet 1)	0.0064	0.22	4.8
Prenatal exposure (mother on Diet 1)	0.065	0.75	5.7
Diet 1	1.7	12	94
Diet 2	0.62	4.8	33
Diet 3	0.13	0.91	6

	Excess Lifetime Risk [ ]		
Diet 1	2.4E-04	3.7E-03	5.7E-02
Diet 2	8.3E-05	1.4E-03	2.0E-02
Diet 3	2.0E-05	2.7E-04	3.5E-03
Diet 4	5.1E-04	1.1E-02	1.9E-01

	Relative Risk [ ]		
Diet 1	1.085	1.87	14
Diet 2	1.032	1.33	5.9
Diet 3	1.0066	1.066	2
Diet 4	1.2	3.4	38

	Probability of Causation [%]		
Diet 1	7.86	46.4	93
Diet 2	3.12	24.9	83
Diet 3	0.66	6.2	50
Diet 4	16.59	70.9	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.7	11	80
Commercial Milk (locally produced)	0.42	3.6	25
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	3.5	33	300
Beef (locally produced)	0.0017	0.031	0.71
Leafy Vegetables (locally produced)	0.00044	0.0053	0.059
Eggs (locally produced)	0.078	0.59	5
Cottage Cheese (locally produced)	0.0019	0.029	0.4
Inhalation	0.021	0.086	0.38
Mother's milk (mother on Diet 1)	0.0064	0.22	4.8
Prenatal exposure (mother on Diet 1)	0.065	0.75	5.7
Diet 1	1.8	12	86
Diet 2	0.62	4.6	31
Diet 3	0.13	0.89	5.1

Excess Lifetime Risk [ ]			
Diet 1	3.0E-05	9.9E-04	1.8E-02
Diet 2	1.3E-05	3.7E-04	8.2E-03
Diet 3	2.7E-06	7.0E-05	1.6E-03
Diet 4	7.0E-05	2.8E-03	7.0E-02

Relative Risk [ ]			
Diet 1	1.038	1.64	15
Diet 2	1.013	1.25	6.5
Diet 3	1.0025	1.049	1.98
Diet 4	1.071	2.7	55

Probability of Causation [%]			
Diet 1	3.70	39.0	93
Diet 2	1.30	20.2	84
Diet 3	0.25	4.6	50
Diet 4	6.64	63.4	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.23	1.7	14
Commercial Milk (locally produced)	0.067	0.57	5.1
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	0.46	5.1	55
Beef (locally produced)	0.00023	0.0051	0.12
Leafy Vegetables (locally produced)	0.000068	0.00085	0.0094
Eggs (locally produced)	0.01	0.093	0.91
Cottage Cheese (locally produced)	0.00027	0.0046	0.069
Inhalation	0.0031	0.013	0.068
Mother's milk (mother on Diet 1)	0.00098	0.035	0.75
Prenatal exposure (mother on Diet 1)	0.0099	0.12	0.95
Diet 1	0.25	1.8	15
Diet 2	0.097	0.72	5.9
Diet 3	0.1	0.84	5.7

Excess Lifetime Risk [ ]			
Diet 1	3.3E-05	5.8E-04	1.1E-02
Diet 2	1.4E-05	2.1E-04	3.4E-03
Diet 3	1.4E-05	2.3E-04	3.2E-03
Diet 4	7.1E-05	1.7E-03	2.9E-02

Relative Risk [ ]			
Diet 1	1.012	1.14	3
Diet 2	1.0042	1.054	1.85
Diet 3	1.0052	1.059	1.97
Diet 4	1.027	1.4	7.3

Probability of Causation [%]			
Diet 1	1.14	12.6	66
Diet 2	0.42	5.1	46
Diet 3	0.51	5.6	49
Diet 4	2.61	28.2	86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.25	1.7	13
Commercial Milk (locally produced)	0.066	0.56	4.6
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.47	5.3	55
Beef (locally produced)	0.00025	0.005	0.13
Leafy Vegetables (locally produced)	0.00006	0.00082	0.0097
Eggs (locally produced)	0.011	0.095	0.92
Cottage Cheese (locally produced)	0.00031	0.0047	0.06
Inhalation	0.003	0.014	0.065
Mother's milk (mother on Diet 1)	0.00098	0.035	0.75
Prenatal exposure (mother on Diet 1)	0.0099	0.12	0.95
Diet 1	0.27	1.8	14
Diet 2	0.097	0.73	5.8
Diet 3	0.11	0.82	5

Excess Lifetime Risk [ ]			
Diet 1	4.0E-06	1.5E-04	3.0E-03
Diet 2	1.8E-06	5.5E-05	1.2E-03
Diet 3	2.2E-06	6.0E-05	1.5E-03
Diet 4	1.1E-05	4.2E-04	1.1E-02

Relative Risk [ ]			
Diet 1	1.0049	1.099	3.3
Diet 2	1.0019	1.038	1.99
Diet 3	1.0022	1.043	1.95
Diet 4	1.0098	1.28	9.6

Probability of Causation [%]			
Diet 1	0.48	9.0	69
Diet 2	0.19	3.6	49
Diet 3	0.22	4.2	49
Diet 4	0.97	21.8	89

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.5	10	81
Commercial Milk (locally produced)	0.41	3.3	26
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	2.8	29	280
Beef (locally produced)	0.0015	0.03	0.62
Leafy Vegetables (locally produced)	0.00042	0.0051	0.05
Eggs (locally produced)	0.069	0.52	4.5
Cottage Cheese (locally produced)	0.0018	0.026	0.33
Inhalation	0.019	0.079	0.35
Mother's milk (mother on Diet 1)	0.0062	0.21	4.3
Prenatal exposure (mother on Diet 1)	0.062	0.67	5.3
Diet 1	1.6	11	86
Diet 2	0.59	4.2	30
Diet 3	0.13	0.89	6

Excess Lifetime Risk [ ]			
Diet 1	2.1E-04	3.5E-03	4.9E-02
Diet 2	7.7E-05	1.2E-03	1.8E-02
Diet 3	2.0E-05	2.7E-04	3.5E-03
Diet 4	4.3E-04	9.8E-03	1.6E-01

Relative Risk [ ]			
Diet 1	1.079	1.8	12
Diet 2	1.028	1.32	5.6
Diet 3	1.0065	1.065	2
Diet 4	1.18	3.3	36

Probability of Causation [%]			
Diet 1	7.32	44.3	92
Diet 2	2.71	24.0	82
Diet 3	0.64	6.1	50
Diet 4	15.09	69.4	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	1.5	10	70
Commercial Milk (locally produced)	0.41	3.3	22
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	3.1	29	270
Beef (locally produced)	0.0015	0.029	0.65
Leafy Vegetables (locally produced)	0.00039	0.0049	0.053
Eggs (locally produced)	0.068	0.52	4.4
Cottage Cheese (locally produced)	0.0017	0.027	0.36
Inhalation	0.019	0.079	0.35
Mother's milk (mother on Diet 1)	0.0062	0.21	4.3
Prenatal exposure (mother on Diet 1)	0.062	0.67	5.3
Diet 1	1.7	11	74
Diet 2	0.6	4.2	27
Diet 3	0.13	0.88	5.1

Excess Lifetime Risk [ ]			
Diet 1	2.8E-05	8.8E-04	1.6E-02
Diet 2	1.2E-05	3.3E-04	7.4E-03
Diet 3	2.7E-06	6.9E-05	1.6E-03
Diet 4	6.2E-05	2.5E-03	6.1E-02

Relative Risk [ ]			
Diet 1	1.035	1.61	14
Diet 2	1.012	1.23	6.1
Diet 3	1.0025	1.048	1.98
Diet 4	1.068	2.7	52

Probability of Causation [%]			
Diet 1	3.38	37.8	93
Diet 2	1.16	18.7	84
Diet 3	0.25	4.6	49
Diet 4	6.31	62.1	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.59	4.3	33
Commercial Milk (locally produced)	0.17	1.4	11
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	1.1	12	120
Beef (locally produced)	0.00063	0.012	0.26
Leafy Vegetables (locally produced)	0.00018	0.0021	0.022
Eggs (locally produced)	0.027	0.22	1.9
Cottage Cheese (locally produced)	0.00073	0.011	0.15
Inhalation	0.0071	0.033	0.16
Mother's milk (mother on Diet 1)	0.0026	0.088	1.9
Prenatal exposure (mother on Diet 1)	0.025	0.28	2.3
Diet 1	0.65	4.6	36
Diet 2	0.25	1.8	13
Diet 3	0.11	0.86	5.8

Excess Lifetime Risk [ ]			
Diet 1	8.7E-05	1.4E-03	2.3E-02
Diet 2	3.4E-05	5.2E-04	7.8E-03
Diet 3	1.6E-05	2.5E-04	3.3E-03
Diet 4	1.9E-04	4.3E-03	7.0E-02

Relative Risk [ ]			
Diet 1	1.034	1.34	5.8
Diet 2	1.012	1.13	2.9
Diet 3	1.0056	1.06	1.98
Diet 4	1.073	1.96	15

Probability of Causation [%]			
Diet 1	3.25	24.6	81
Diet 2	1.22	11.3	64
Diet 3	0.55	5.7	49
Diet 4	6.74	47.4	93

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.65	4.2	30
Commercial Milk (locally produced)	0.17	1.4	9.8
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	1.4	12	120
Beef (locally produced)	0.00062	0.012	0.28
Leafy Vegetables (locally produced)	0.00017	0.0021	0.024
Eggs (locally produced)	0.029	0.23	2
Cottage Cheese (locally produced)	0.00073	0.011	0.15
Inhalation	0.0081	0.034	0.15
Mother's milk (mother on Diet 1)	0.0026	0.088	1.9
Prenatal exposure (mother on Diet 1)	0.025	0.28	2.3
Diet 1	0.72	4.5	32
Diet 2	0.25	1.8	12
Diet 3	0.11	0.84	5

Excess Lifetime Risk [ ]			
Diet 1	1.2E-05	3.8E-04	6.9E-03
Diet 2	5.0E-06	1.4E-04	3.0E-03
Diet 3	2.3E-06	6.4E-05	1.5E-03
Diet 4	2.6E-05	1.1E-03	2.8E-02

Relative Risk [ ]			
Diet 1	1.014	1.26	6.1
Diet 2	1.0049	1.097	3.2
Diet 3	1.0023	1.045	1.96
Diet 4	1.027	1.69	23

Probability of Causation [%]			
Diet 1	1.34	20.0	82
Diet 2	0.49	8.7	67
Diet 3	0.23	4.3	49
Diet 4	2.65	39.7	95

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.00077	0.012	0.15
Inhalation	0.0082	0.037	0.17
Mother's milk (mother on Diet 3)	0.00062	0.014	0.24
Prenatal exposure (mother on Diet 3)	0.0066	0.042	0.35
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.11	0.86	5.8

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.6E-05	2.5E-04	3.3E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0056	1.061	1.98
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.56	5.7	49
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0008	0.012	0.17
Inhalation	0.0086	0.037	0.16
Mother's milk (mother on Diet 3)	0.00062	0.014	0.24
Prenatal exposure (mother on Diet 3)	0.0066	0.042	0.35
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.11	0.84	5

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	2.3E-06	6.4E-05	1.5E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0023	1.045	1.96
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.23	4.3	49
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.71	5.3	39
Commercial Milk (locally produced)	0.21	1.7	13
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	1.4	15	150
Beef (locally produced)	0.00071	0.015	0.32
Leafy Vegetables (locally produced)	0.00023	0.0026	0.027
Eggs (locally produced)	0.034	0.28	2.1
Cottage Cheese (locally produced)	0.00078	0.013	0.17
Inhalation	0.009	0.044	0.19
Mother's milk (mother on Diet 1)	0.0031	0.1	2.1
Prenatal exposure (mother on Diet 1)	0.03	0.34	2.6
Diet 1	0.79	5.6	42
Diet 2	0.28	2.2	15
Diet 3	0.11	0.87	5.8

Excess Lifetime Risk [ ]			
Diet 1	1.1E-04	1.7E-03	2.9E-02
Diet 2	3.9E-05	6.4E-04	9.3E-03
Diet 3	1.7E-05	2.5E-04	3.3E-03
Diet 4	2.2E-04	5.1E-03	8.9E-02

Relative Risk [ ]			
Diet 1	1.039	1.43	6.6
Diet 2	1.014	1.16	3.3
Diet 3	1.0057	1.061	1.99
Diet 4	1.086	2.1	18

Probability of Causation [%]			
Diet 1	3.76	29.9	85
Diet 2	1.36	13.8	69
Diet 3	0.57	5.8	50
Diet 4	7.92	52.9	95

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.77	5	35
Commercial Milk (locally produced)	0.21	1.7	11
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	1.7	15	150
Beef (locally produced)	0.00074	0.015	0.33
Leafy Vegetables (locally produced)	0.00022	0.0025	0.028
Eggs (locally produced)	0.038	0.28	2.3
Cottage Cheese (locally produced)	0.00093	0.013	0.2
Inhalation	0.0094	0.044	0.19
Mother's milk (mother on Diet 1)	0.0031	0.1	2.1
Prenatal exposure (mother on Diet 1)	0.03	0.34	2.6
Diet 1	0.85	5.4	37
Diet 2	0.3	2.2	13
Diet 3	0.12	0.85	5.1

Excess Lifetime Risk [ ]			
Diet 1	1.6E-05	4.5E-04	9.6E-03
Diet 2	6.2E-06	1.8E-04	3.8E-03
Diet 3	2.4E-06	6.5E-05	1.5E-03
Diet 4	3.1E-05	1.3E-03	3.2E-02

Relative Risk [ ]			
Diet 1	1.016	1.31	7.2
Diet 2	1.0058	1.12	3.6
Diet 3	1.0023	1.045	1.97
Diet 4	1.036	1.83	25

Probability of Causation [%]			
Diet 1	1.62	23.4	86
Diet 2	0.58	10.6	72
Diet 3	0.23	4.4	49
Diet 4	3.45	45.4	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.79	5.6	42
Commercial Milk (locally produced)	0.23	1.9	14
Commercial Milk (regionally mixed)	0.095	0.82	5.7
Goat Milk (locally produced)	1.6	17	180
Beef (locally produced)	0.00085	0.017	0.38
Leafy Vegetables (locally produced)	0.00024	0.0029	0.03
Eggs (locally produced)	0.039	0.31	2.5
Cottage Cheese (locally produced)	0.00098	0.015	0.2
Inhalation	0.011	0.05	0.22
Mother's milk (mother on Diet 1)	0.0033	0.12	2.5
Prenatal exposure (mother on Diet 1)	0.034	0.38	2.7
Diet 1	0.88	6.2	45
Diet 2	0.33	2.4	16
Diet 3	0.12	0.87	5.9

Excess Lifetime Risk [ ]			
Diet 1	1.2E-04	2.0E-03	3.2E-02
Diet 2	4.5E-05	7.2E-04	9.6E-03
Diet 3	1.7E-05	2.5E-04	3.4E-03
Diet 4	2.5E-04	5.8E-03	1.0E-01

Relative Risk [ ]			
Diet 1	1.046	1.48	7
Diet 2	1.015	1.18	3.9
Diet 3	1.0059	1.062	1.99
Diet 4	1.094	2.3	22

Probability of Causation [%]			
Diet 1	4.42	32.1	85
Diet 2	1.50	15.0	74
Diet 3	0.58	5.8	50
Diet 4	8.57	55.7	95

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.9	5.6	43
Commercial Milk (locally produced)	0.21	1.9	12
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	1.8	18	180
Beef (locally produced)	0.00086	0.016	0.4
Leafy Vegetables (locally produced)	0.00022	0.0028	0.03
Eggs (locally produced)	0.041	0.31	2.6
Cottage Cheese (locally produced)	0.001	0.016	0.19
Inhalation	0.011	0.051	0.21
Mother's milk (mother on Diet 1)	0.0033	0.12	2.5
Prenatal exposure (mother on Diet 1)	0.034	0.38	2.7
Diet 1	0.98	6.1	46
Diet 2	0.32	2.4	15
Diet 3	0.12	0.86	5

Excess Lifetime Risk [ ]			
Diet 1	1.5E-05	4.8E-04	9.3E-03
Diet 2	6.6E-06	1.9E-04	4.6E-03
Diet 3	2.4E-06	6.6E-05	1.5E-03
Diet 4	3.4E-05	1.4E-03	3.7E-02

Relative Risk [ ]			
Diet 1	1.02	1.34	8.1
Diet 2	1.0063	1.13	4
Diet 3	1.0024	1.046	1.97
Diet 4	1.039	1.98	29

Probability of Causation [%]			
Diet 1	1.95	25.2	88
Diet 2	0.63	11.3	75
Diet 3	0.24	4.4	49
Diet 4	3.78	49.4	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.54	3.6	26
Commercial Milk (locally produced)	0.14	1.1	9.5
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.00051	0.01	0.23
Leafy Vegetables (locally produced)	0.00017	0.0018	0.018
Eggs (locally produced)	0.023	0.18	1.6
Cottage Cheese (locally produced)	0.00051	0.0092	0.12
Inhalation	0.0068	0.031	0.14
Mother's milk (mother on Diet 1)	0.0022	0.064	1.6
Prenatal exposure (mother on Diet 1)	0.024	0.23	1.8
Diet 1	0.61	3.9	28
Diet 2	0.21	1.4	11
Diet 3	0.11	0.85	5.8

Excess Lifetime Risk [ ]			
Diet 1	7.2E-05	1.2E-03	1.9E-02
Diet 2	2.8E-05	4.2E-04	6.4E-03
Diet 3	1.5E-05	2.5E-04	3.3E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.027	1.28	5.2
Diet 2	1.01	1.1	2.7
Diet 3	1.0055	1.06	1.98
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	2.62	21.6	81
Diet 2	0.99	9.5	62
Diet 3	0.55	5.7	49
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.52	3.5	24
Commercial Milk (locally produced)	0.14	1.1	8
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.00056	0.01	0.24
Leafy Vegetables (locally produced)	0.00015	0.0017	0.017
Eggs (locally produced)	0.026	0.19	1.5
Cottage Cheese (locally produced)	0.00065	0.0091	0.12
Inhalation	0.0073	0.03	0.14
Mother's milk (mother on Diet 1)	0.0022	0.064	1.6
Prenatal exposure (mother on Diet 1)	0.024	0.23	1.8
Diet 1	0.59	3.7	25
Diet 2	0.2	1.4	9.3
Diet 3	0.11	0.84	5

Excess Lifetime Risk [ ]			
Diet 1	8.8E-06	2.9E-04	5.6E-03
Diet 2	3.9E-06	1.2E-04	2.9E-03
Diet 3	2.3E-06	6.3E-05	1.5E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.011	1.21	5.1
Diet 2	1.0041	1.075	2.8
Diet 3	1.0023	1.045	1.96
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	1.09	17.2	80
Diet 2	0.41	7.0	64
Diet 3	0.23	4.3	49
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**

**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.64	4.5	37
Commercial Milk (locally produced)	0.19	1.5	11
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	1.3	14	130
Beef (locally produced)	0.00062	0.013	0.29
Leafy Vegetables (locally produced)	0.00019	0.0023	0.023
Eggs (locally produced)	0.03	0.24	2
Cottage Cheese (locally produced)	0.00077	0.012	0.15
Inhalation	0.0089	0.039	0.19
Mother's milk (mother on Diet 1)	0.0028	0.096	1.8
Prenatal exposure (mother on Diet 1)	0.028	0.3	2.2
Diet 1	0.71	4.9	39
Diet 2	0.26	1.9	13
Diet 3	0.11	0.86	5.8

Excess Lifetime Risk [ ]			
Diet 1	9.5E-05	1.5E-03	2.5E-02
Diet 2	3.7E-05	5.5E-04	7.7E-03
Diet 3	1.6E-05	2.5E-04	3.3E-03
Diet 4	1.8E-04	4.4E-03	8.3E-02

Relative Risk [ ]			
Diet 1	1.035	1.38	5.9
Diet 2	1.012	1.14	3.3
Diet 3	1.0056	1.061	1.98
Diet 4	1.081	1.97	18

Probability of Causation [%]			
Diet 1	3.41	27.7	83
Diet 2	1.23	12.5	69
Diet 3	0.56	5.7	50
Diet 4	7.46	49.1	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.7	4.4	33
Commercial Milk (locally produced)	0.19	1.5	10
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	1.4	13	120
Beef (locally produced)	0.00071	0.013	0.31
Leafy Vegetables (locally produced)	0.00017	0.0022	0.024
Eggs (locally produced)	0.03	0.24	2.1
Cottage Cheese (locally produced)	0.00075	0.013	0.15
Inhalation	0.0096	0.04	0.17
Mother's milk (mother on Diet 1)	0.0028	0.096	1.8
Prenatal exposure (mother on Diet 1)	0.028	0.3	2.2
Diet 1	0.76	4.8	35
Diet 2	0.27	2	12
Diet 3	0.11	0.85	5

Excess Lifetime Risk [ ]			
Diet 1	1.3E-05	3.9E-04	7.0E-03
Diet 2	5.4E-06	1.5E-04	3.3E-03
Diet 3	2.4E-06	6.5E-05	1.5E-03
Diet 4	2.9E-05	1.2E-03	2.7E-02

Relative Risk [ ]			
Diet 1	1.015	1.26	6.6
Diet 2	1.0051	1.1	3.3
Diet 3	1.0023	1.045	1.96
Diet 4	1.031	1.73	24

Probability of Causation [%]			
Diet 1	1.45	20.8	85
Diet 2	0.50	9.3	69
Diet 3	0.23	4.3	49
Diet 4	3.05	41.9	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.86	6.1	42
Commercial Milk (locally produced)	0.25	2.1	14
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	1.8	18	180
Beef (locally produced)	0.00088	0.017	0.39
Leafy Vegetables (locally produced)	0.00027	0.003	0.03
Eggs (locally produced)	0.042	0.33	2.7
Cottage Cheese (locally produced)	0.00095	0.016	0.19
Inhalation	0.011	0.055	0.24
Mother's milk (mother on Diet 1)	0.0038	0.13	2.5
Prenatal exposure (mother on Diet 1)	0.038	0.41	2.8
Diet 1	0.96	6.6	45
Diet 2	0.36	2.6	16
Diet 3	0.12	0.87	5.9

Excess Lifetime Risk [ ]			
Diet 1	1.3E-04	2.1E-03	3.3E-02
Diet 2	4.9E-05	7.4E-04	1.0E-02
Diet 3	1.7E-05	2.6E-04	3.4E-03
Diet 4	2.6E-04	6.0E-03	1.0E-01

Relative Risk [ ]			
Diet 1	1.049	1.51	7
Diet 2	1.017	1.19	3.9
Diet 3	1.0059	1.062	1.99
Diet 4	1.1	2.4	23

Probability of Causation [%]			
Diet 1	4.71	33.9	86
Diet 2	1.64	16.3	74
Diet 3	0.59	5.9	50
Diet 4	9.30	57.8	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.96	6.1	41
Commercial Milk (locally produced)	0.23	2.1	13
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	2	19	170
Beef (locally produced)	0.00094	0.017	0.4
Leafy Vegetables (locally produced)	0.00022	0.003	0.03
Eggs (locally produced)	0.043	0.33	2.8
Cottage Cheese (locally produced)	0.0011	0.017	0.2
Inhalation	0.012	0.056	0.22
Mother's milk (mother on Diet 1)	0.0038	0.13	2.5
Prenatal exposure (mother on Diet 1)	0.038	0.41	2.8
Diet 1	1	6.6	45
Diet 2	0.35	2.6	15
Diet 3	0.12	0.86	5.1

Excess Lifetime Risk [ ]			
Diet 1	1.7E-05	5.2E-04	9.6E-03
Diet 2	7.1E-06	2.0E-04	4.5E-03
Diet 3	2.5E-06	6.7E-05	1.5E-03
Diet 4	3.9E-05	1.5E-03	3.8E-02

Relative Risk [ ]			
Diet 1	1.021	1.36	8.7
Diet 2	1.0069	1.14	4
Diet 3	1.0024	1.046	1.97
Diet 4	1.042	2	30

Probability of Causation [%]			
Diet 1	2.08	26.5	88
Diet 2	0.69	12.1	75
Diet 3	0.24	4.4	49
Diet 4	4.03	50.1	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.49	3.4	27
Commercial Milk (locally produced)	0.14	1.1	8.7
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	0.93	9.9	99
Beef (locally produced)	0.00049	0.01	0.22
Leafy Vegetables (locally produced)	0.00016	0.0017	0.017
Eggs (locally produced)	0.022	0.18	1.5
Cottage Cheese (locally produced)	0.00053	0.009	0.12
Inhalation	0.0071	0.031	0.15
Mother's milk (mother on Diet 1)	0.0021	0.072	1.4
Prenatal exposure (mother on Diet 1)	0.02	0.23	1.7
Diet 1	0.55	3.7	28
Diet 2	0.2	1.5	11
Diet 3	0.11	0.86	5.8

Excess Lifetime Risk [ ]			
Diet 1	7.4E-05	1.2E-03	1.9E-02
Diet 2	2.9E-05	4.2E-04	6.0E-03
Diet 3	1.5E-05	2.4E-04	3.3E-03
Diet 4	1.5E-04	3.4E-03	5.7E-02

Relative Risk [ ]			
Diet 1	1.027	1.28	4.7
Diet 2	1.0092	1.11	2.6
Diet 3	1.0055	1.06	1.98
Diet 4	1.057	1.77	13

Probability of Causation [%]			
Diet 1	2.63	22.0	78
Diet 2	0.91	9.6	61
Diet 3	0.55	5.7	49
Diet 4	5.40	43.3	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.53	3.4	23
Commercial Milk (locally produced)	0.14	1.1	7.5
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	1.1	10	100
Beef (locally produced)	0.00051	0.0099	0.22
Leafy Vegetables (locally produced)	0.00014	0.0017	0.018
Eggs (locally produced)	0.024	0.18	1.6
Cottage Cheese (locally produced)	0.00059	0.009	0.11
Inhalation	0.0071	0.032	0.14
Mother's milk (mother on Diet 1)	0.0021	0.072	1.4
Prenatal exposure (mother on Diet 1)	0.02	0.23	1.7
Diet 1	0.59	3.7	25
Diet 2	0.21	1.5	9.4
Diet 3	0.11	0.84	5

Excess Lifetime Risk [ ]			
Diet 1	9.8E-06	2.9E-04	5.4E-03
Diet 2	4.1E-06	1.1E-04	2.4E-03
Diet 3	2.3E-06	6.3E-05	1.5E-03
Diet 4	2.0E-05	8.4E-04	2.2E-02

Relative Risk [ ]			
Diet 1	1.011	1.21	5.1
Diet 2	1.0039	1.08	2.7
Diet 3	1.0023	1.045	1.96
Diet 4	1.023	1.56	17

Probability of Causation [%]			
Diet 1	1.08	17.3	80
Diet 2	0.39	7.4	63
Diet 3	0.23	4.3	49
Diet 4	2.21	35.9	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.3	2.1	15
Commercial Milk (locally produced)	0.082	0.65	5.5
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	0.57	5.9	58
Beef (locally produced)	0.00029	0.0058	0.13
Leafy Vegetables (locally produced)	0.000097	0.001	0.011
Eggs (locally produced)	0.013	0.11	0.91
Cottage Cheese (locally produced)	0.0003	0.0053	0.069
Inhalation	0.0039	0.017	0.075
Mother's milk (mother on Diet 1)	0.0012	0.038	0.93
Prenatal exposure (mother on Diet 1)	0.014	0.13	1.1
Diet 1	0.34	2.2	16
Diet 2	0.12	0.82	6.1
Diet 3	0.1	0.84	5.7

Excess Lifetime Risk [ ]			
Diet 1	4.3E-05	7.1E-04	1.1E-02
Diet 2	1.6E-05	2.5E-04	3.6E-03
Diet 3	1.4E-05	2.4E-04	3.2E-03
Diet 4	9.5E-05	2.1E-03	4.0E-02

Relative Risk [ ]			
Diet 1	1.015	1.16	3.4
Diet 2	1.0058	1.061	1.95
Diet 3	1.0052	1.059	1.97
Diet 4	1.035	1.46	8.4

Probability of Causation [%]			
Diet 1	1.51	13.5	70
Diet 2	0.57	5.8	49
Diet 3	0.52	5.6	49
Diet 4	3.36	31.4	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.3	2	14
Commercial Milk (locally produced)	0.079	0.63	4.5
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.62	5.8	54
Beef (locally produced)	0.00032	0.0059	0.13
Leafy Vegetables (locally produced)	0.000086	0.00099	0.0095
Eggs (locally produced)	0.015	0.11	0.89
Cottage Cheese (locally produced)	0.00037	0.0054	0.069
Inhalation	0.0041	0.017	0.074
Mother's milk (mother on Diet 1)	0.0012	0.038	0.93
Prenatal exposure (mother on Diet 1)	0.014	0.13	1.1
Diet 1	0.34	2.2	15
Diet 2	0.12	0.84	5.4
Diet 3	0.11	0.82	5

Excess Lifetime Risk [ ]			
Diet 1	5.1E-06	1.7E-04	3.2E-03
Diet 2	2.3E-06	6.9E-05	1.6E-03
Diet 3	2.2E-06	6.1E-05	1.5E-03
Diet 4	1.2E-05	5.0E-04	1.3E-02

Relative Risk [ ]			
Diet 1	1.0065	1.12	3.4
Diet 2	1.0023	1.043	2
Diet 3	1.0022	1.044	1.95
Diet 4	1.014	1.34	10.9

Probability of Causation [%]			
Diet 1	0.64	10.7	70
Diet 2	0.23	4.1	51
Diet 3	0.22	4.2	49
Diet 4	1.40	25.1	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.68	4.9	36
Commercial Milk (locally produced)	0.19	1.6	12
Commercial Milk (regionally mixed)	0.095	0.82	5.7
Goat Milk (locally produced)	1.4	14	130
Beef (locally produced)	0.00068	0.014	0.29
Leafy Vegetables (locally produced)	0.00021	0.0024	0.025
Eggs (locally produced)	0.033	0.26	2
Cottage Cheese (locally produced)	0.00072	0.012	0.15
Inhalation	0.0096	0.044	0.19
Mother's milk (mother on Diet 1)	0.0031	0.1	1.9
Prenatal exposure (mother on Diet 1)	0.03	0.33	2.3
Diet 1	0.77	5.3	39
Diet 2	0.27	2.1	13
Diet 3	0.11	0.87	5.8

	Excess Lifetime Risk [ ]		
Diet 1	1.0E-04	1.6E-03	2.8E-02
Diet 2	3.6E-05	6.0E-04	8.6E-03
Diet 3	1.7E-05	2.5E-04	3.3E-03
Diet 4	2.1E-04	4.8E-03	8.2E-02

	Relative Risk [ ]		
Diet 1	1.036	1.4	6.3
Diet 2	1.013	1.15	3.2
Diet 3	1.0057	1.061	1.99
Diet 4	1.082	2.1	17

	Probability of Causation [%]		
Diet 1	3.50	28.7	84
Diet 2	1.30	13.3	69
Diet 3	0.57	5.8	50
Diet 4	7.57	51.4	94

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.74	4.7	31
Commercial Milk (locally produced)	0.19	1.6	10
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	1.6	14	130
Beef (locally produced)	0.0007	0.014	0.3
Leafy Vegetables (locally produced)	0.0002	0.0024	0.026
Eggs (locally produced)	0.036	0.26	2.2
Cottage Cheese (locally produced)	0.00084	0.013	0.18
Inhalation	0.0095	0.045	0.2
Mother's milk (mother on Diet 1)	0.0031	0.1	1.9
Prenatal exposure (mother on Diet 1)	0.03	0.33	2.3
Diet 1	0.83	5.2	34
Diet 2	0.29	2.1	13
Diet 3	0.12	0.85	5.1

Excess Lifetime Risk [ ]			
Diet 1	1.4E-05	4.3E-04	8.6E-03
Diet 2	5.6E-06	1.7E-04	3.5E-03
Diet 3	2.4E-06	6.5E-05	1.5E-03
Diet 4	2.9E-05	1.2E-03	2.9E-02

Relative Risk [ ]			
Diet 1	1.016	1.28	6.7
Diet 2	1.0056	1.11	3.4
Diet 3	1.0023	1.045	1.97
Diet 4	1.035	1.78	23

Probability of Causation [%]			
Diet 1	1.57	22.1	85
Diet 2	0.56	9.9	70
Diet 3	0.23	4.4	49
Diet 4	3.38	43.7	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.16	1.2	8.9
Commercial Milk (locally produced)	0.04	0.37	3.1
Commercial Milk (regionally mixed)	0.095	0.82	5.7
Goat Milk (locally produced)	0.29	3.3	33
Beef (locally produced)	0.00016	0.0032	0.067
Leafy Vegetables (locally produced)	0.000047	0.00058	0.006
Eggs (locally produced)	0.0067	0.06	0.51
Cottage Cheese (locally produced)	0.00018	0.0029	0.039
Inhalation	0.0022	0.01	0.048
Mother's milk (mother on Diet 1)	0.00067	0.023	0.5
Prenatal exposure (mother on Diet 1)	0.0073	0.076	0.59
Diet 1	0.17	1.3	9.5
Diet 2	0.061	0.48	3.6
Diet 3	0.099	0.83	5.7

Excess Lifetime Risk [ ]			
Diet 1	2.2E-05	4.0E-04	6.3E-03
Diet 2	7.8E-06	1.4E-04	2.0E-03
Diet 3	1.4E-05	2.3E-04	3.2E-03
Diet 4	4.7E-05	1.1E-03	2.0E-02

Relative Risk [ ]			
Diet 1	1.0076	1.09	2.3
Diet 2	1.0028	1.035	1.57
Diet 3	1.0051	1.059	1.96
Diet 4	1.018	1.26	5.3

Probability of Causation [%]			
Diet 1	0.75	8.2	56
Diet 2	0.28	3.4	36
Diet 3	0.51	5.6	49
Diet 4	1.80	20.1	80

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.16	1.1	8.1
Commercial Milk (locally produced)	0.04	0.38	2.6
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.35	3.3	33
Beef (locally produced)	0.00016	0.0033	0.07
Leafy Vegetables (locally produced)	0.000044	0.00056	0.0059
Eggs (locally produced)	0.0073	0.06	0.52
Cottage Cheese (locally produced)	0.0002	0.003	0.044
Inhalation	0.0022	0.01	0.046
Mother's milk (mother on Diet 1)	0.00067	0.023	0.5
Prenatal exposure (mother on Diet 1)	0.0073	0.076	0.59
Diet 1	0.18	1.2	8.8
Diet 2	0.061	0.48	3.1
Diet 3	0.11	0.81	5

Excess Lifetime Risk [ ]			
Diet 1	2.9E-06	9.7E-05	2.1E-03
Diet 2	1.3E-06	4.0E-05	8.4E-04
Diet 3	2.1E-06	6.0E-05	1.5E-03
Diet 4	6.7E-06	2.9E-04	7.2E-03

Relative Risk [ ]			
Diet 1	1.0036	1.066	2.5
Diet 2	1.0013	1.026	1.57
Diet 3	1.0022	1.043	1.95
Diet 4	1.0073	1.19	6.5

Probability of Causation [%]			
Diet 1	0.36	6.2	58
Diet 2	0.13	2.5	36
Diet 3	0.22	4.1	49
Diet 4	0.73	16.0	84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.58	4.1	31
Commercial Milk (locally produced)	0.17	1.4	9.5
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	1.2	12	110
Beef (locally produced)	0.00058	0.012	0.24
Leafy Vegetables (locally produced)	0.00018	0.002	0.02
Eggs (locally produced)	0.028	0.21	1.7
Cottage Cheese (locally produced)	0.00063	0.01	0.13
Inhalation	0.008	0.037	0.16
Mother's milk (mother on Diet 1)	0.0025	0.082	1.7
Prenatal exposure (mother on Diet 1)	0.025	0.27	1.9
Diet 1	0.64	4.5	33
Diet 2	0.23	1.7	11
Diet 3	0.11	0.86	5.8

Excess Lifetime Risk [ ]			
Diet 1	8.7E-05	1.4E-03	2.2E-02
Diet 2	3.1E-05	5.0E-04	7.1E-03
Diet 3	1.6E-05	2.5E-04	3.3E-03
Diet 4	1.7E-04	4.0E-03	6.7E-02

Relative Risk [ ]			
Diet 1	1.032	1.33	5.6
Diet 2	1.011	1.13	2.8
Diet 3	1.0056	1.061	1.98
Diet 4	1.071	1.89	14

Probability of Causation [%]			
Diet 1	3.14	25.0	82
Diet 2	1.10	11.3	64
Diet 3	0.56	5.7	49
Diet 4	6.65	47.0	93

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.63	3.9	27
Commercial Milk (locally produced)	0.16	1.3	8.8
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	1.4	12	110
Beef (locally produced)	0.00061	0.012	0.26
Leafy Vegetables (locally produced)	0.00016	0.002	0.021
Eggs (locally produced)	0.03	0.22	1.7
Cottage Cheese (locally produced)	0.00073	0.011	0.14
Inhalation	0.0081	0.037	0.16
Mother's milk (mother on Diet 1)	0.0025	0.082	1.7
Prenatal exposure (mother on Diet 1)	0.025	0.27	1.9
Diet 1	0.69	4.3	29
Diet 2	0.25	1.7	11
Diet 3	0.11	0.84	5

Excess Lifetime Risk [ ]			
Diet 1	1.2E-05	3.5E-04	7.1E-03
Diet 2	4.9E-06	1.4E-04	3.0E-03
Diet 3	2.4E-06	6.4E-05	1.5E-03
Diet 4	2.5E-05	9.8E-04	2.5E-02

Relative Risk [ ]			
Diet 1	1.013	1.24	5.8
Diet 2	1.0047	1.092	3
Diet 3	1.0023	1.045	1.96
Diet 4	1.029	1.65	20

Probability of Causation [%]			
Diet 1	1.30	19.4	83
Diet 2	0.47	8.4	67
Diet 3	0.23	4.3	49
Diet 4	2.77	39.4	95

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	2	13
Commercial Milk (locally produced)	0.079	0.65	5
Commercial Milk (regionally mixed)	0.095	0.82	5.7
Goat Milk (locally produced)	0.55	5.7	57
Beef (locally produced)	0.00027	0.0055	0.13
Leafy Vegetables (locally produced)	0.00009	0.00097	0.0097
Eggs (locally produced)	0.012	0.1	0.86
Cottage Cheese (locally produced)	0.00029	0.0052	0.062
Inhalation	0.0037	0.017	0.073
Mother's milk (mother on Diet 1)	0.0012	0.039	0.83
Prenatal exposure (mother on Diet 1)	0.013	0.13	0.96
Diet 1	0.32	2.1	15
Diet 2	0.11	0.82	5.6
Diet 3	0.1	0.84	5.7

Excess Lifetime Risk [ ]			
Diet 1	4.0E-05	6.7E-04	1.1E-02
Diet 2	1.5E-05	2.4E-04	3.5E-03
Diet 3	1.4E-05	2.4E-04	3.2E-03
Diet 4	8.9E-05	2.0E-03	3.6E-02

Relative Risk [ ]			
Diet 1	1.015	1.16	3.1
Diet 2	1.0051	1.061	1.94
Diet 3	1.0052	1.059	1.97
Diet 4	1.032	1.44	8.2

Probability of Causation [%]			
Diet 1	1.45	13.5	67
Diet 2	0.51	5.7	48
Diet 3	0.52	5.6	49
Diet 4	3.12	30.3	87

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.3	2	13
Commercial Milk (locally produced)	0.076	0.63	4.4
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.59	5.7	54
Beef (locally produced)	0.0003	0.0056	0.12
Leafy Vegetables (locally produced)	0.000079	0.00094	0.0095
Eggs (locally produced)	0.013	0.1	0.88
Cottage Cheese (locally produced)	0.00035	0.0052	0.066
Inhalation	0.004	0.018	0.076
Mother's milk (mother on Diet 1)	0.0012	0.039	0.83
Prenatal exposure (mother on Diet 1)	0.013	0.13	0.96
Diet 1	0.33	2.1	14
Diet 2	0.11	0.82	5.2
Diet 3	0.11	0.82	5

Excess Lifetime Risk [ ]			
Diet 1	5.4E-06	1.7E-04	3.1E-03
Diet 2	2.2E-06	6.5E-05	1.5E-03
Diet 3	2.2E-06	6.1E-05	1.5E-03
Diet 4	1.3E-05	4.8E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.006	1.12	3.3
Diet 2	1.0021	1.043	1.93
Diet 3	1.0022	1.044	1.95
Diet 4	1.013	1.32	10.3

Probability of Causation [%]			
Diet 1	0.60	10.3	69
Diet 2	0.21	4.1	48
Diet 3	0.22	4.2	49
Diet 4	1.31	24.0	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.44	3.2	24
Commercial Milk (locally produced)	0.12	1	7.6
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	0.85	8.8	85
Beef (locally produced)	0.00044	0.009	0.18
Leafy Vegetables (locally produced)	0.00013	0.0016	0.016
Eggs (locally produced)	0.021	0.16	1.3
Cottage Cheese (locally produced)	0.00051	0.0078	0.099
Inhalation	0.0065	0.028	0.12
Mother's milk (mother on Diet 1)	0.0019	0.065	1.2
Prenatal exposure (mother on Diet 1)	0.02	0.21	1.5
Diet 1	0.48	3.5	26
Diet 2	0.17	1.3	8.8
Diet 3	0.11	0.85	5.8

Excess Lifetime Risk [ ]			
Diet 1	6.3E-05	1.1E-03	1.7E-02
Diet 2	2.2E-05	3.9E-04	5.2E-03
Diet 3	1.5E-05	2.4E-04	3.3E-03
Diet 4	1.3E-04	3.1E-03	5.0E-02

Relative Risk [ ]			
Diet 1	1.023	1.25	4.5
Diet 2	1.0081	1.099	2.4
Diet 3	1.0055	1.06	1.98
Diet 4	1.052	1.69	11

Probability of Causation [%]			
Diet 1	2.27	19.9	77
Diet 2	0.81	9.0	57
Diet 3	0.54	5.7	49
Diet 4	4.92	40.5	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.47	3.1	20
Commercial Milk (locally produced)	0.12	1.1	6.7
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.99	9.1	84
Beef (locally produced)	0.00047	0.0089	0.19
Leafy Vegetables (locally produced)	0.00012	0.0015	0.016
Eggs (locally produced)	0.022	0.16	1.4
Cottage Cheese (locally produced)	0.00053	0.0082	0.11
Inhalation	0.0064	0.028	0.13
Mother's milk (mother on Diet 1)	0.0019	0.065	1.2
Prenatal exposure (mother on Diet 1)	0.02	0.21	1.5
Diet 1	0.52	3.3	22
Diet 2	0.18	1.3	8.4
Diet 3	0.11	0.83	5

Excess Lifetime Risk [ ]			
Diet 1	8.4E-06	2.7E-04	5.3E-03
Diet 2	3.7E-06	1.1E-04	2.3E-03
Diet 3	2.3E-06	6.2E-05	1.5E-03
Diet 4	1.9E-05	7.7E-04	1.8E-02

Relative Risk [ ]			
Diet 1	1.011	1.18	4.8
Diet 2	1.0037	1.07	2.5
Diet 3	1.0023	1.044	1.96
Diet 4	1.022	1.51	16

Probability of Causation [%]			
Diet 1	1.08	15.5	78
Diet 2	0.37	6.6	60
Diet 3	0.23	4.3	49
Diet 4	2.17	33.4	93

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.23	1.7	12
Commercial Milk (locally produced)	0.067	0.59	4
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	0.55	5.2	53
Beef (locally produced)	0.00025	0.005	0.11
Leafy Vegetables (locally produced)	0.000076	0.00086	0.0084
Eggs (locally produced)	0.011	0.096	0.75
Cottage Cheese (locally produced)	0.00027	0.0048	0.056
Inhalation	0.0038	0.019	0.088
Mother's milk (mother on Diet 1)	0.0011	0.036	0.76
Prenatal exposure (mother on Diet 1)	0.011	0.12	0.9
Diet 1	0.27	1.9	13
Diet 2	0.1	0.76	4.8
Diet 3	0.1	0.84	5.7

Excess Lifetime Risk [ ]			
Diet 1	3.5E-05	6.1E-04	9.9E-03
Diet 2	1.4E-05	2.2E-04	2.9E-03
Diet 3	1.4E-05	2.4E-04	3.2E-03
Diet 4	7.3E-05	1.8E-03	3.1E-02

Relative Risk [ ]			
Diet 1	1.014	1.15	2.6
Diet 2	1.0046	1.057	1.78
Diet 3	1.0053	1.059	1.97
Diet 4	1.028	1.4	7.9

Probability of Causation [%]			
Diet 1	1.35	13.3	61
Diet 2	0.45	5.4	44
Diet 3	0.53	5.6	49
Diet 4	2.73	28.7	87

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.26	1.8	12
Commercial Milk (locally produced)	0.063	0.61	4
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.52	5.3	52
Beef (locally produced)	0.00026	0.0049	0.11
Leafy Vegetables (locally produced)	0.000072	0.00086	0.0083
Eggs (locally produced)	0.012	0.094	0.89
Cottage Cheese (locally produced)	0.00032	0.0051	0.062
Inhalation	0.0041	0.02	0.082
Mother's milk (mother on Diet 1)	0.0011	0.036	0.76
Prenatal exposure (mother on Diet 1)	0.011	0.12	0.9
Diet 1	0.29	2	12
Diet 2	0.099	0.75	4.8
Diet 3	0.11	0.82	5

Excess Lifetime Risk [ ]			
Diet 1	5.1E-06	1.5E-04	3.0E-03
Diet 2	1.9E-06	5.8E-05	1.3E-03
Diet 3	2.2E-06	6.2E-05	1.5E-03
Diet 4	1.0E-05	4.3E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.0056	1.11	3.5
Diet 2	1.0018	1.04	1.87
Diet 3	1.0022	1.044	1.95
Diet 4	1.011	1.31	9.5

Probability of Causation [%]			
Diet 1	0.56	9.7	71
Diet 2	0.18	3.8	47
Diet 3	0.22	4.2	49
Diet 4	1.08	23.5	89

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.062	0.5	4.2
Commercial Milk (locally produced)	0.018	0.16	1.4
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	0.14	1.5	15
Beef (locally produced)	0.00007	0.0014	0.038
Leafy Vegetables (locally produced)	0.000019	0.00025	0.0026
Eggs (locally produced)	0.0024	0.026	0.24
Cottage Cheese (locally produced)	0.000077	0.0013	0.018
Inhalation	0.00089	0.0043	0.024
Mother's milk (mother on Diet 1)	0.00028	0.01	0.22
Prenatal exposure (mother on Diet 1)	0.003	0.032	0.26
Diet 1	0.072	0.54	4.4
Diet 2	0.026	0.2	1.7
Diet 3	0.096	0.82	5.7

Excess Lifetime Risk [ ]			
Diet 1	8.3E-06	1.6E-04	3.0E-03
Diet 2	3.8E-06	6.0E-05	9.4E-04
Diet 3	1.3E-05	2.3E-04	3.2E-03
Diet 4	1.7E-05	4.6E-04	9.8E-03

Relative Risk [ ]			
Diet 1	1.0038	1.04	1.54
Diet 2	1.0014	1.015	1.25
Diet 3	1.005	1.058	1.96
Diet 4	1.0082	1.11	3.1

Probability of Causation [%]			
Diet 1	0.38	3.9	35
Diet 2	0.14	1.5	20
Diet 3	0.49	5.5	49
Diet 4	0.81	9.7	68

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**  
**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.064	0.48	4
Commercial Milk (locally produced)	0.018	0.16	1.2
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.14	1.5	15
Beef (locally produced)	0.000075	0.0014	0.039
Leafy Vegetables (locally produced)	0.000018	0.00024	0.0027
Eggs (locally produced)	0.0027	0.028	0.26
Cottage Cheese (locally produced)	0.000081	0.0014	0.017
Inhalation	0.00096	0.0046	0.023
Mother's milk (mother on Diet 1)	0.00028	0.01	0.22
Prenatal exposure (mother on Diet 1)	0.003	0.032	0.26
Diet 1	0.072	0.52	4.3
Diet 2	0.028	0.21	1.5
Diet 3	0.1	0.81	5

Excess Lifetime Risk [ ]			
Diet 1	1.2E-06	4.1E-05	8.0E-04
Diet 2	5.5E-07	1.6E-05	3.5E-04
Diet 3	2.1E-06	5.9E-05	1.5E-03
Diet 4	3.1E-06	1.2E-04	3.1E-03

Relative Risk [ ]			
Diet 1	1.0013	1.029	1.65
Diet 2	1.0005	1.01	1.28
Diet 3	1.0022	1.043	1.94
Diet 4	1.0028	1.079	3.3

Probability of Causation [%]			
Diet 1	0.13	2.8	39
Diet 2	0.05	1.0	22
Diet 3	0.22	4.1	49
Diet 4	0.28	7.3	70

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.26	2	16
Commercial Milk (locally produced)	0.086	0.68	5.2
Commercial Milk (regionally mixed)	0.095	0.82	5.7
Goat Milk (locally produced)	0.58	6	58
Beef (locally produced)	0.00029	0.0059	0.13
Leafy Vegetables (locally produced)	0.000088	0.001	0.011
Eggs (locally produced)	0.013	0.11	0.9
Cottage Cheese (locally produced)	0.00035	0.0052	0.071
Inhalation	0.0042	0.02	0.093
Mother's milk (mother on Diet 1)	0.0012	0.043	0.86
Prenatal exposure (mother on Diet 1)	0.012	0.13	1
Diet 1	0.29	2.2	17
Diet 2	0.12	0.87	6.3
Diet 3	0.1	0.85	5.7

Excess Lifetime Risk [ ]			
Diet 1	4.2E-05	6.9E-04	1.2E-02
Diet 2	1.7E-05	2.6E-04	3.7E-03
Diet 3	1.4E-05	2.4E-04	3.3E-03
Diet 4	8.3E-05	2.0E-03	3.5E-02

Relative Risk [ ]			
Diet 1	1.016	1.17	3.1
Diet 2	1.0056	1.063	1.96
Diet 3	1.0053	1.059	1.97
Diet 4	1.033	1.45	7.9

Probability of Causation [%]			
Diet 1	1.55	14.2	67
Diet 2	0.56	5.9	48
Diet 3	0.53	5.6	49
Diet 4	3.22	30.2	87

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.31	2	14
Commercial Milk (locally produced)	0.082	0.67	4.6
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.68	6	62
Beef (locally produced)	0.0003	0.0059	0.14
Leafy Vegetables (locally produced)	0.000081	0.00098	0.011
Eggs (locally produced)	0.014	0.11	0.96
Cottage Cheese (locally produced)	0.00034	0.0055	0.065
Inhalation	0.0044	0.02	0.086
Mother's milk (mother on Diet 1)	0.0012	0.043	0.86
Prenatal exposure (mother on Diet 1)	0.012	0.13	1
Diet 1	0.34	2.2	15
Diet 2	0.12	0.86	5.5
Diet 3	0.11	0.82	5

Excess Lifetime Risk [ ]			
Diet 1	5.8E-06	1.8E-04	3.2E-03
Diet 2	2.5E-06	6.7E-05	1.5E-03
Diet 3	2.2E-06	6.1E-05	1.5E-03
Diet 4	1.4E-05	5.0E-04	1.3E-02

Relative Risk [ ]			
Diet 1	1.0062	1.12	3.3
Diet 2	1.0023	1.045	2.1
Diet 3	1.0023	1.044	1.95
Diet 4	1.014	1.33	10.6

Probability of Causation [%]			
Diet 1	0.62	10.6	69
Diet 2	0.23	4.3	51
Diet 3	0.23	4.2	49
Diet 4	1.40	24.2	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.26	1.9	14
Commercial Milk (locally produced)	0.074	0.62	4.7
Commercial Milk (regionally mixed)	0.094	0.82	5.7
Goat Milk (locally produced)	0.53	5.5	54
Beef (locally produced)	0.00027	0.0053	0.12
Leafy Vegetables (locally produced)	0.000085	0.00093	0.0092
Eggs (locally produced)	0.011	0.1	0.8
Cottage Cheese (locally produced)	0.0003	0.0049	0.063
Inhalation	0.0042	0.019	0.092
Mother's milk (mother on Diet 1)	0.0012	0.038	0.79
Prenatal exposure (mother on Diet 1)	0.012	0.12	0.93
Diet 1	0.29	2	15
Diet 2	0.11	0.8	5.4
Diet 3	0.1	0.84	5.7

Excess Lifetime Risk [ ]			
Diet 1	3.7E-05	6.2E-04	1.1E-02
Diet 2	1.5E-05	2.3E-04	3.5E-03
Diet 3	1.4E-05	2.4E-04	3.2E-03
Diet 4	7.8E-05	1.9E-03	3.6E-02

Relative Risk [ ]			
Diet 1	1.015	1.15	2.8
Diet 2	1.0052	1.059	1.92
Diet 3	1.0053	1.06	1.97
Diet 4	1.032	1.42	8.1

Probability of Causation [%]			
Diet 1	1.44	13.1	64
Diet 2	0.52	5.6	48
Diet 3	0.53	5.6	49
Diet 4	3.11	29.3	87

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	1.8	12
Commercial Milk (locally produced)	0.076	0.61	4.3
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.54	5.5	53
Beef (locally produced)	0.00028	0.0053	0.12
Leafy Vegetables (locally produced)	0.000076	0.00089	0.0095
Eggs (locally produced)	0.012	0.1	0.9
Cottage Cheese (locally produced)	0.00032	0.0051	0.063
Inhalation	0.0045	0.02	0.09
Mother's milk (mother on Diet 1)	0.0012	0.038	0.79
Prenatal exposure (mother on Diet 1)	0.012	0.12	0.93
Diet 1	0.31	2	13
Diet 2	0.11	0.8	5
Diet 3	0.11	0.82	5

Excess Lifetime Risk [ ]			
Diet 1	5.3E-06	1.6E-04	2.8E-03
Diet 2	2.1E-06	6.1E-05	1.4E-03
Diet 3	2.2E-06	6.1E-05	1.5E-03
Diet 4	1.2E-05	4.6E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.0054	1.11	3.2
Diet 2	1.002	1.042	1.93
Diet 3	1.0023	1.044	1.95
Diet 4	1.013	1.3	9.8

Probability of Causation [%]			
Diet 1	0.54	10.0	68
Diet 2	0.20	4.0	48
Diet 3	0.23	4.2	49
Diet 4	1.24	23.1	89

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.3	2.2	17
Commercial Milk (locally produced)	0.087	0.71	5.2
Commercial Milk (regionally mixed)	0.095	0.81	5.7
Goat Milk (locally produced)	0.59	6.3	59
Beef (locally produced)	0.00031	0.0061	0.14
Leafy Vegetables (locally produced)	0.000097	0.001	0.011
Eggs (locally produced)	0.013	0.12	0.97
Cottage Cheese (locally produced)	0.00035	0.0056	0.07
Inhalation	0.0051	0.023	0.11
Mother's milk (mother on Diet 1)	0.0013	0.044	0.83
Prenatal exposure (mother on Diet 1)	0.013	0.14	1
Diet 1	0.34	2.3	18
Diet 2	0.12	0.91	6.2
Diet 3	0.11	0.85	5.8

Excess Lifetime Risk [ ]			
Diet 1	4.5E-05	7.3E-04	1.3E-02
Diet 2	1.7E-05	2.7E-04	3.6E-03
Diet 3	1.5E-05	2.4E-04	3.3E-03
Diet 4	9.0E-05	2.1E-03	3.8E-02

Relative Risk [ ]			
Diet 1	1.016	1.18	3.1
Diet 2	1.0058	1.067	1.9
Diet 3	1.0053	1.06	1.98
Diet 4	1.037	1.47	8.6

Probability of Causation [%]			
Diet 1	1.56	15.1	68
Diet 2	0.58	6.3	47
Diet 3	0.53	5.6	49
Diet 4	3.53	32.0	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.32	2.1	15
Commercial Milk (locally produced)	0.084	0.7	4.7
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.68	6.4	59
Beef (locally produced)	0.00032	0.006	0.15
Leafy Vegetables (locally produced)	0.000082	0.001	0.011
Eggs (locally produced)	0.014	0.11	1
Cottage Cheese (locally produced)	0.00035	0.0058	0.071
Inhalation	0.0052	0.023	0.1
Mother's milk (mother on Diet 1)	0.0013	0.044	0.83
Prenatal exposure (mother on Diet 1)	0.013	0.14	1
Diet 1	0.36	2.3	16
Diet 2	0.13	0.91	5.4
Diet 3	0.11	0.83	5

Excess Lifetime Risk [ ]			
Diet 1	6.4E-06	1.8E-04	3.2E-03
Diet 2	2.6E-06	6.8E-05	1.5E-03
Diet 3	2.2E-06	6.2E-05	1.5E-03
Diet 4	1.3E-05	5.1E-04	1.3E-02

Relative Risk [ ]			
Diet 1	1.0067	1.13	3.7
Diet 2	1.0024	1.049	2.1
Diet 3	1.0023	1.044	1.95
Diet 4	1.014	1.35	11

Probability of Causation [%]			
Diet 1	0.67	11.3	73
Diet 2	0.24	4.7	52
Diet 3	0.23	4.2	49
Diet 4	1.43	26.0	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.16	1.1	9
Commercial Milk (locally produced)	0.043	0.39	3.4
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	0.36	3.5	34
Beef (locally produced)	0.00018	0.0034	0.074
Leafy Vegetables (locally produced)	0.00005	0.00057	0.0059
Eggs (locally produced)	0.007	0.059	0.57
Cottage Cheese (locally produced)	0.0002	0.0032	0.048
Inhalation	0.0029	0.013	0.066
Mother's milk (mother on Diet 1)	0.00088	0.024	0.47
Prenatal exposure (mother on Diet 1)	0.0068	0.075	0.65
Diet 1	0.18	1.3	9.6
Diet 2	0.067	0.5	3.9
Diet 3	0.1	0.84	5.7

	Excess Lifetime Risk [ ]		
Diet 1	2.5E-05	3.8E-04	6.3E-03
Diet 2	1.1E-05	1.4E-04	2.1E-03
Diet 3	1.4E-05	2.3E-04	3.2E-03
Diet 4	4.7E-05	1.2E-03	2.1E-02

	Relative Risk [ ]		
Diet 1	1.0095	1.091	2.2
Diet 2	1.0034	1.035	1.53
Diet 3	1.0052	1.059	1.96
Diet 4	1.019	1.26	5.3

	Probability of Causation [%]		
Diet 1	0.94	8.3	54
Diet 2	0.34	3.4	34
Diet 3	0.51	5.6	49
Diet 4	1.87	20.5	81

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.16	1.1	8.1
Commercial Milk (locally produced)	0.046	0.39	2.6
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.36	3.4	35
Beef (locally produced)	0.00018	0.0034	0.08
Leafy Vegetables (locally produced)	0.000049	0.00054	0.0067
Eggs (locally produced)	0.0079	0.062	0.59
Cottage Cheese (locally produced)	0.00019	0.003	0.041
Inhalation	0.0031	0.013	0.065
Mother's milk (mother on Diet 1)	0.00088	0.024	0.47
Prenatal exposure (mother on Diet 1)	0.0068	0.075	0.65
Diet 1	0.18	1.2	8.6
Diet 2	0.07	0.5	3.3
Diet 3	0.11	0.82	5

Excess Lifetime Risk [ ]			
Diet 1	3.0E-06	1.0E-04	1.8E-03
Diet 2	1.4E-06	3.8E-05	8.4E-04
Diet 3	2.2E-06	6.1E-05	1.5E-03
Diet 4	6.7E-06	2.9E-04	7.1E-03

Relative Risk [ ]			
Diet 1	1.0036	1.072	2.4
Diet 2	1.0013	1.027	1.55
Diet 3	1.0023	1.044	1.95
Diet 4	1.0078	1.2	6.5

Probability of Causation [%]			
Diet 1	0.36	6.8	58
Diet 2	0.13	2.6	36
Diet 3	0.23	4.2	49
Diet 4	0.78	16.3	85

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.27	1.9	14
Commercial Milk (locally produced)	0.074	0.6	4.8
Commercial Milk (regionally mixed)	0.095	0.81	5.7
Goat Milk (locally produced)	0.56	5.4	50
Beef (locally produced)	0.00027	0.0053	0.11
Leafy Vegetables (locally produced)	0.00008	0.00093	0.009
Eggs (locally produced)	0.012	0.094	0.82
Cottage Cheese (locally produced)	0.00031	0.0047	0.065
Inhalation	0.0045	0.019	0.092
Mother's milk (mother on Diet 1)	0.0012	0.036	0.77
Prenatal exposure (mother on Diet 1)	0.012	0.12	0.93
Diet 1	0.3	2	15
Diet 2	0.11	0.78	5.5
Diet 3	0.1	0.84	5.8

Excess Lifetime Risk [ ]			
Diet 1	4.0E-05	6.2E-04	8.9E-03
Diet 2	1.5E-05	2.3E-04	3.0E-03
Diet 3	1.4E-05	2.4E-04	3.3E-03
Diet 4	7.7E-05	1.9E-03	3.0E-02

Relative Risk [ ]			
Diet 1	1.015	1.15	2.9
Diet 2	1.005	1.058	1.8
Diet 3	1.0053	1.06	1.97
Diet 4	1.031	1.4	7.2

Probability of Causation [%]			
Diet 1	1.44	12.7	65
Diet 2	0.50	5.5	44
Diet 3	0.53	5.6	49
Diet 4	3.00	28.5	86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**  
**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.28	1.8	12
Commercial Milk (locally produced)	0.07	0.62	3.9
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.58	5.3	50
Beef (locally produced)	0.00028	0.0052	0.11
Leafy Vegetables (locally produced)	0.000069	0.00088	0.0093
Eggs (locally produced)	0.013	0.098	0.8
Cottage Cheese (locally produced)	0.00032	0.0048	0.062
Inhalation	0.0048	0.02	0.087
Mother's milk (mother on Diet 1)	0.0012	0.036	0.77
Prenatal exposure (mother on Diet 1)	0.012	0.12	0.93
Diet 1	0.31	2	13
Diet 2	0.11	0.77	4.8
Diet 3	0.11	0.82	5

Excess Lifetime Risk [ ]			
Diet 1	4.8E-06	1.6E-04	3.0E-03
Diet 2	2.3E-06	6.2E-05	1.3E-03
Diet 3	2.2E-06	6.1E-05	1.5E-03
Diet 4	1.1E-05	4.4E-04	1.1E-02

Relative Risk [ ]			
Diet 1	1.0059	1.11	3.3
Diet 2	1.0021	1.042	1.9
Diet 3	1.0023	1.044	1.95
Diet 4	1.012	1.31	9.8

Probability of Causation [%]			
Diet 1	0.58	10.1	69
Diet 2	0.21	4.1	47
Diet 3	0.23	4.2	49
Diet 4	1.19	23.3	89

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.17	1.1	8.2
Commercial Milk (locally produced)	0.047	0.38	2.8
Commercial Milk (regionally mixed)	0.095	0.82	5.7
Goat Milk (locally produced)	0.34	3.4	30
Beef (locally produced)	0.00017	0.0033	0.075
Leafy Vegetables (locally produced)	0.000049	0.00059	0.0057
Eggs (locally produced)	0.0071	0.059	0.45
Cottage Cheese (locally produced)	0.00017	0.0029	0.038
Inhalation	0.0022	0.011	0.05
Mother's milk (mother on Diet 1)	0.00069	0.023	0.48
Prenatal exposure (mother on Diet 1)	0.0072	0.075	0.53
Diet 1	0.18	1.2	8.7
Diet 2	0.065	0.48	3.2
Diet 3	0.099	0.83	5.7

Excess Lifetime Risk [ ]			
Diet 1	2.4E-05	3.8E-04	6.2E-03
Diet 2	8.7E-06	1.4E-04	2.1E-03
Diet 3	1.4E-05	2.3E-04	3.2E-03
Diet 4	4.4E-05	1.1E-03	2.0E-02

Relative Risk [ ]			
Diet 1	1.0092	1.091	2.1
Diet 2	1.0033	1.036	1.57
Diet 3	1.0051	1.059	1.96
Diet 4	1.021	1.25	5.1

Probability of Causation [%]			
Diet 1	0.91	8.3	52
Diet 2	0.33	3.4	36
Diet 3	0.51	5.6	49
Diet 4	2.05	19.9	80

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**  
**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.17	1.1	7.2
Commercial Milk (locally produced)	0.049	0.37	2.5
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.37	3.4	30
Beef (locally produced)	0.00019	0.0032	0.076
Leafy Vegetables (locally produced)	0.000047	0.00055	0.0059
Eggs (locally produced)	0.008	0.062	0.51
Cottage Cheese (locally produced)	0.0002	0.003	0.041
Inhalation	0.0024	0.011	0.048
Mother's milk (mother on Diet 1)	0.00069	0.023	0.48
Prenatal exposure (mother on Diet 1)	0.0072	0.075	0.53
Diet 1	0.19	1.2	7.8
Diet 2	0.07	0.47	3
Diet 3	0.11	0.81	5

Excess Lifetime Risk [ ]			
Diet 1	3.2E-06	1.0E-04	1.8E-03
Diet 2	1.4E-06	3.8E-05	8.4E-04
Diet 3	2.2E-06	6.0E-05	1.5E-03
Diet 4	7.6E-06	2.7E-04	6.9E-03

Relative Risk [ ]			
Diet 1	1.0035	1.068	2.3
Diet 2	1.0012	1.025	1.56
Diet 3	1.0022	1.043	1.95
Diet 4	1.008	1.18	6.5

Probability of Causation [%]			
Diet 1	0.35	6.4	57
Diet 2	0.12	2.4	35
Diet 3	0.22	4.1	49
Diet 4	0.80	15.3	84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways  
Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways  
Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)  
Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.18	1.4	9.7
Commercial Milk (locally produced)	0.053	0.46	3.3
Commercial Milk (regionally mixed)	0.094	0.82	5.7
Goat Milk (locally produced)	0.37	4.1	42
Beef (locally produced)	0.00019	0.0038	0.082
Leafy Vegetables (locally produced)	0.000063	0.00066	0.0066
Eggs (locally produced)	0.0081	0.075	0.59
Cottage Cheese (locally produced)	0.00021	0.0037	0.045
Inhalation	0.0032	0.015	0.064
Mother's milk (mother on Diet 1)	0.00088	0.028	0.6
Prenatal exposure (mother on Diet 1)	0.0085	0.094	0.7
Diet 1	0.2	1.5	10
Diet 2	0.077	0.59	3.9
Diet 3	0.1	0.84	5.7

Excess Lifetime Risk [ ]			
Diet 1	2.6E-05	4.6E-04	7.9E-03
Diet 2	1.1E-05	1.7E-04	2.7E-03
Diet 3	1.4E-05	2.4E-04	3.2E-03
Diet 4	5.8E-05	1.4E-03	2.5E-02

Relative Risk [ ]			
Diet 1	1.011	1.11	2.2
Diet 2	1.0036	1.045	1.69
Diet 3	1.0052	1.059	1.97
Diet 4	1.021	1.32	5.9

Probability of Causation [%]			
Diet 1	1.06	10.0	54
Diet 2	0.36	4.3	41
Diet 3	0.52	5.6	49
Diet 4	2.09	24.1	83

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.21	1.4	8.7
Commercial Milk (locally produced)	0.052	0.45	3.2
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.38	4.1	41
Beef (locally produced)	0.0002	0.0039	0.079
Leafy Vegetables (locally produced)	0.000058	0.00064	0.0068
Eggs (locally produced)	0.0085	0.07	0.65
Cottage Cheese (locally produced)	0.00024	0.0036	0.046
Inhalation	0.0035	0.016	0.071
Mother's milk (mother on Diet 1)	0.00088	0.028	0.6
Prenatal exposure (mother on Diet 1)	0.0085	0.094	0.7
Diet 1	0.23	1.5	9.2
Diet 2	0.08	0.57	3.7
Diet 3	0.11	0.82	5

Excess Lifetime Risk [ ]			
Diet 1	4.1E-06	1.2E-04	2.2E-03
Diet 2	1.6E-06	4.4E-05	9.9E-04
Diet 3	2.2E-06	6.0E-05	1.5E-03
Diet 4	9.4E-06	3.4E-04	8.8E-03

Relative Risk [ ]			
Diet 1	1.0038	1.084	2.6
Diet 2	1.0014	1.031	1.64
Diet 3	1.0022	1.043	1.95
Diet 4	1.0087	1.23	7.1

Probability of Causation [%]			
Diet 1	0.38	7.7	61
Diet 2	0.14	3.0	39
Diet 3	0.22	4.2	49
Diet 4	0.86	18.4	86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.33	2.4	17
Commercial Milk (locally produced)	0.088	0.77	5.9
Commercial Milk (regionally mixed)	0.094	0.82	5.7
Goat Milk (locally produced)	0.68	6.8	63
Beef (locally produced)	0.00034	0.0066	0.14
Leafy Vegetables (locally produced)	0.0001	0.0012	0.011
Eggs (locally produced)	0.015	0.12	1
Cottage Cheese (locally produced)	0.00039	0.0059	0.077
Inhalation	0.0056	0.024	0.11
Mother's milk (mother on Diet 1)	0.0014	0.047	0.95
Prenatal exposure (mother on Diet 1)	0.015	0.16	1.2
Diet 1	0.37	2.6	18
Diet 2	0.13	0.98	7
Diet 3	0.11	0.85	5.8

Excess Lifetime Risk [ ]			
Diet 1	4.8E-05	7.8E-04	1.2E-02
Diet 2	1.7E-05	2.9E-04	3.9E-03
Diet 3	1.5E-05	2.4E-04	3.3E-03
Diet 4	1.0E-04	2.4E-03	4.0E-02

Relative Risk [ ]			
Diet 1	1.018	1.19	3.4
Diet 2	1.0067	1.073	1.97
Diet 3	1.0054	1.06	1.97
Diet 4	1.041	1.52	8.4

Probability of Causation [%]			
Diet 1	1.79	16.0	70
Diet 2	0.67	6.8	49
Diet 3	0.54	5.6	49
Diet 4	3.90	34.1	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.34	2.3	15
Commercial Milk (locally produced)	0.087	0.77	5.1
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.75	6.8	63
Beef (locally produced)	0.00036	0.0065	0.14
Leafy Vegetables (locally produced)	0.000094	0.0011	0.012
Eggs (locally produced)	0.016	0.12	1
Cottage Cheese (locally produced)	0.00041	0.0062	0.08
Inhalation	0.0058	0.025	0.11
Mother's milk (mother on Diet 1)	0.0014	0.047	0.95
Prenatal exposure (mother on Diet 1)	0.015	0.16	1.2
Diet 1	0.38	2.6	16
Diet 2	0.13	0.99	6
Diet 3	0.11	0.83	5

Excess Lifetime Risk [ ]			
Diet 1	6.2E-06	2.0E-04	3.7E-03
Diet 2	2.8E-06	7.9E-05	1.6E-03
Diet 3	2.3E-06	6.2E-05	1.5E-03
Diet 4	1.5E-05	5.6E-04	1.5E-02

Relative Risk [ ]			
Diet 1	1.0077	1.14	3.8
Diet 2	1.0028	1.054	2.1
Diet 3	1.0023	1.044	1.95
Diet 4	1.016	1.38	12

Probability of Causation [%]			
Diet 1	0.76	12.4	74
Diet 2	0.28	5.1	52
Diet 3	0.23	4.2	49
Diet 4	1.57	27.4	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.16	1.2	8.3
Commercial Milk (locally produced)	0.044	0.37	2.8
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	0.31	3.2	33
Beef (locally produced)	0.00017	0.0032	0.071
Leafy Vegetables (locally produced)	0.000052	0.00058	0.0056
Eggs (locally produced)	0.0066	0.063	0.52
Cottage Cheese (locally produced)	0.00016	0.003	0.04
Inhalation	0.0028	0.013	0.066
Mother's milk (mother on Diet 1)	0.00071	0.024	0.48
Prenatal exposure (mother on Diet 1)	0.0068	0.079	0.56
Diet 1	0.18	1.3	8.8
Diet 2	0.066	0.48	3.3
Diet 3	0.1	0.84	5.7

Excess Lifetime Risk [ ]			
Diet 1	2.5E-05	4.0E-04	7.5E-03
Diet 2	8.8E-06	1.5E-04	2.0E-03
Diet 3	1.4E-05	2.3E-04	3.2E-03
Diet 4	5.0E-05	1.1E-03	1.9E-02

Relative Risk [ ]			
Diet 1	1.0084	1.093	2.2
Diet 2	1.003	1.035	1.47
Diet 3	1.0052	1.059	1.96
Diet 4	1.018	1.25	4.9

Probability of Causation [%]			
Diet 1	0.83	8.5	54
Diet 2	0.30	3.4	32
Diet 3	0.51	5.6	49
Diet 4	1.81	19.9	79

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.16	1.2	7.6
Commercial Milk (locally produced)	0.045	0.38	2.6
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.39	3.4	33
Beef (locally produced)	0.00018	0.0031	0.07
Leafy Vegetables (locally produced)	0.000045	0.00055	0.0052
Eggs (locally produced)	0.0078	0.062	0.55
Cottage Cheese (locally produced)	0.00019	0.0029	0.034
Inhalation	0.0029	0.014	0.058
Mother's milk (mother on Diet 1)	0.00071	0.024	0.48
Prenatal exposure (mother on Diet 1)	0.0068	0.079	0.56
Diet 1	0.18	1.3	8.3
Diet 2	0.066	0.49	3
Diet 3	0.11	0.82	5

Excess Lifetime Risk [ ]			
Diet 1	3.5E-06	9.3E-05	1.8E-03
Diet 2	1.4E-06	3.8E-05	7.3E-04
Diet 3	2.2E-06	6.0E-05	1.5E-03
Diet 4	7.2E-06	2.7E-04	8.2E-03

Relative Risk [ ]			
Diet 1	1.0036	1.07	2.5
Diet 2	1.0013	1.027	1.57
Diet 3	1.0022	1.043	1.95
Diet 4	1.0083	1.19	6.8

Probability of Causation [%]			
Diet 1	0.36	6.5	60
Diet 2	0.13	2.6	36
Diet 3	0.22	4.2	49
Diet 4	0.83	15.7	85

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**  
**Receptor: Female born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.31	2.2	16
Commercial Milk (locally produced)	0.089	0.69	5.1
Commercial Milk (regionally mixed)	0.094	0.81	5.7
Goat Milk (locally produced)	0.65	6.2	59
Beef (locally produced)	0.00032	0.0062	0.12
Leafy Vegetables (locally produced)	0.000093	0.0011	0.01
Eggs (locally produced)	0.014	0.11	0.93
Cottage Cheese (locally produced)	0.00035	0.0055	0.073
Inhalation	0.0049	0.021	0.096
Mother's milk (mother on Diet 1)	0.0013	0.041	0.95
Prenatal exposure (mother on Diet 1)	0.013	0.14	1
Diet 1	0.34	2.3	17
Diet 2	0.12	0.89	6.2
Diet 3	0.1	0.85	5.8

Excess Lifetime Risk [ ]			
Diet 1	4.7E-05	7.3E-04	1.0E-02
Diet 2	1.7E-05	2.7E-04	3.5E-03
Diet 3	1.4E-05	2.4E-04	3.3E-03
Diet 4	9.2E-05	2.1E-03	3.4E-02

Relative Risk [ ]			
Diet 1	1.018	1.17	3.3
Diet 2	1.0059	1.066	1.93
Diet 3	1.0053	1.06	1.97
Diet 4	1.037	1.47	7.9

Probability of Causation [%]			
Diet 1	1.77	14.4	70
Diet 2	0.59	6.2	48
Diet 3	0.53	5.6	49
Diet 4	3.60	31.7	87

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**

**Receptor: Male born in 1954**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.33	2.1	14
Commercial Milk (locally produced)	0.082	0.7	4.7
Commercial Milk (regionally mixed)	0.1	0.8	5
Goat Milk (locally produced)	0.72	6.2	57
Beef (locally produced)	0.00034	0.006	0.13
Leafy Vegetables (locally produced)	0.00008	0.001	0.011
Eggs (locally produced)	0.015	0.11	0.93
Cottage Cheese (locally produced)	0.00038	0.0056	0.067
Inhalation	0.0052	0.021	0.091
Mother's milk (mother on Diet 1)	0.0013	0.041	0.95
Prenatal exposure (mother on Diet 1)	0.013	0.14	1
Diet 1	0.36	2.3	15
Diet 2	0.13	0.9	5.7
Diet 3	0.11	0.82	5

Excess Lifetime Risk [ ]			
Diet 1	5.6E-06	1.8E-04	3.5E-03
Diet 2	2.7E-06	7.0E-05	1.5E-03
Diet 3	2.3E-06	6.2E-05	1.5E-03
Diet 4	1.3E-05	5.0E-04	1.4E-02

Relative Risk [ ]			
Diet 1	1.0068	1.13	3.6
Diet 2	1.0024	1.049	2.1
Diet 3	1.0023	1.044	1.95
Diet 4	1.014	1.35	11

Probability of Causation [%]			
Diet 1	0.68	11.7	72
Diet 2	0.24	4.7	52
Diet 3	0.23	4.2	49
Diet 4	1.42	26.0	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.31	4.5	58
Commercial Milk (locally produced)	0.12	1.7	21
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.93	18	260
Beef (locally produced)	0.00018	0.0039	0.089
Leafy Vegetables (locally produced)	0.00024	0.003	0.034
Eggs (locally produced)	0.012	0.19	2.6
Cottage Cheese (locally produced)	0.0006	0.015	0.35
Inhalation	0.0059	0.037	0.2
Mother's milk (mother on Diet 1)	0.0085	0.26	9.1
Prenatal exposure (mother on Diet 1)	0.079	0.89	11
Diet 1	0.36	5	60
Diet 2	0.21	2.1	24
Diet 3	0.037	0.27	2.5

Excess Lifetime Risk [ ]			
Diet 1	6.2E-05	1.4E-03	3.1E-02
Diet 2	3.4E-05	6.4E-04	1.1E-02
Diet 3	5.6E-06	8.8E-05	1.3E-03
Diet 4	1.8E-04	5.7E-03	1.6E-01

Relative Risk [ ]			
Diet 1	1.021	1.36	9.2
Diet 2	1.0099	1.15	4.7
Diet 3	1.0015	1.02	1.39
Diet 4	1.056	2.3	33

Probability of Causation [%]			
Diet 1	2.10	26.2	89
Diet 2	0.99	12.8	78
Diet 3	0.15	2.0	28
Diet 4	5.28	56.0	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Bradbury**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.33	4.7	61
Commercial Milk (locally produced)	0.12	1.7	16
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	1.3	18	320
Beef (locally produced)	0.00018	0.0036	0.09
Leafy Vegetables (locally produced)	0.00018	0.003	0.037
Eggs (locally produced)	0.013	0.19	2.8
Cottage Cheese (locally produced)	0.00064	0.015	0.27
Inhalation	0.0068	0.037	0.2
Mother's milk (mother on Diet 1)	0.0085	0.26	9.1
Prenatal exposure (mother on Diet 1)	0.079	0.89	11
Diet 1	0.37	5	66
Diet 2	0.2	2.1	18
Diet 3	0.035	0.28	2.3

Excess Lifetime Risk [ ]			
Diet 1	1.1E-05	3.6E-04	1.3E-02
Diet 2	4.7E-06	1.5E-04	4.3E-03
Diet 3	6.9E-07	2.0E-05	5.9E-04
Diet 4	3.4E-05	1.3E-03	5.5E-02

Relative Risk [ ]			
Diet 1	1.011	1.27	9.7
Diet 2	1.005	1.11	4.2
Diet 3	1.00076	1.014	1.38
Diet 4	1.03	2	41

Probability of Causation [%]			
Diet 1	1.10	21.1	89
Diet 2	0.50	9.7	76
Diet 3	0.08	1.4	27
Diet 4	2.90	49.9	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.4	5.7	66
Commercial Milk (locally produced)	0.15	2.1	22
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	1.2	21	300
Beef (locally produced)	0.00024	0.0046	0.11
Leafy Vegetables (locally produced)	0.00032	0.0037	0.041
Eggs (locally produced)	0.015	0.23	3
Cottage Cheese (locally produced)	0.00075	0.018	0.37
Inhalation	0.0075	0.046	0.23
Mother's milk (mother on Diet 1)	0.011	0.32	10
Prenatal exposure (mother on Diet 1)	0.1	1.1	13
Diet 1	0.46	6.1	70
Diet 2	0.24	2.6	25
Diet 3	0.04	0.28	2.5

Excess Lifetime Risk [ ]			
Diet 1	7.2E-05	1.8E-03	4.0E-02
Diet 2	4.7E-05	8.2E-04	1.5E-02
Diet 3	6.2E-06	9.2E-05	1.3E-03
Diet 4	2.0E-04	6.8E-03	1.9E-01

Relative Risk [ ]			
Diet 1	1.031	1.44	10.8
Diet 2	1.011	1.18	5
Diet 3	1.0016	1.021	1.4
Diet 4	1.071	2.7	40

Probability of Causation [%]			
Diet 1	3.05	30.5	91
Diet 2	1.09	15.4	80
Diet 3	0.16	2.1	28
Diet 4	6.59	62.8	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Gallaher Bend**  
**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.41	5.8	66
Commercial Milk (locally produced)	0.15	2.1	19
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	1.5	22	370
Beef (locally produced)	0.0002	0.0044	0.11
Leafy Vegetables (locally produced)	0.00022	0.0037	0.043
Eggs (locally produced)	0.017	0.24	3.2
Cottage Cheese (locally produced)	0.00075	0.018	0.32
Inhalation	0.009	0.045	0.23
Mother's milk (mother on Diet 1)	0.011	0.32	10
Prenatal exposure (mother on Diet 1)	0.1	1.1	13
Diet 1	0.49	6.2	69
Diet 2	0.26	2.7	22
Diet 3	0.038	0.28	2.3

Excess Lifetime Risk [ ]			
Diet 1	1.5E-05	4.4E-04	1.7E-02
Diet 2	6.7E-06	1.9E-04	5.3E-03
Diet 3	7.3E-07	2.0E-05	6.0E-04
Diet 4	4.5E-05	1.6E-03	6.5E-02

Relative Risk [ ]			
Diet 1	1.014	1.34	11
Diet 2	1.0059	1.13	4.7
Diet 3	1.0008	1.014	1.38
Diet 4	1.038	2.2	46

Probability of Causation [%]			
Diet 1	1.35	25.3	91
Diet 2	0.59	11.6	79
Diet 3	0.08	1.4	27
Diet 4	3.63	55.4	98

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.081	1.2	15
Commercial Milk (locally produced)	0.031	0.43	5.5
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.000043	0.00096	0.023
Leafy Vegetables (locally produced)	0.000063	0.00078	0.0086
Eggs (locally produced)	0.003	0.049	0.68
Cottage Cheese (locally produced)	0.00017	0.0038	0.084
Inhalation	0.0016	0.0099	0.051
Mother's milk (mother on Diet 1)	0.0022	0.072	2.3
Prenatal exposure (mother on Diet 1)	0.022	0.23	2.9
Diet 1	0.092	1.3	15
Diet 2	0.054	0.53	6.1
Diet 3	0.025	0.24	2.4

Excess Lifetime Risk [ ]			
Diet 1	1.6E-05	3.9E-04	7.9E-03
Diet 2	9.0E-06	1.7E-04	3.1E-03
Diet 3	4.4E-06	7.4E-05	1.2E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.0056	1.093	3.1
Diet 2	1.0025	1.039	1.88
Diet 3	1.001	1.018	1.38
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.56	8.4	65
Diet 2	0.25	3.7	45
Diet 3	0.10	1.7	27
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: EFPC**  
**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.086	1.2	15
Commercial Milk (locally produced)	0.031	0.43	4.7
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.000046	0.00094	0.025
Leafy Vegetables (locally produced)	0.000047	0.00076	0.0096
Eggs (locally produced)	0.0035	0.052	0.66
Cottage Cheese (locally produced)	0.00018	0.0039	0.073
Inhalation	0.0019	0.01	0.052
Mother's milk (mother on Diet 1)	0.0022	0.072	2.3
Prenatal exposure (mother on Diet 1)	0.022	0.23	2.9
Diet 1	0.099	1.3	16
Diet 2	0.051	0.54	5.2
Diet 3	0.023	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	2.9E-06	9.7E-05	3.4E-03
Diet 2	1.3E-06	4.0E-05	1.1E-03
Diet 3	6.1E-07	1.8E-05	5.5E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.003	1.07	3.2
Diet 2	1.0013	1.028	1.93
Diet 3	1.00056	1.012	1.36
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.30	6.5	67
Diet 2	0.13	2.7	47
Diet 3	0.06	1.2	26
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.21	3.2	38
Commercial Milk (locally produced)	0.086	1.2	13
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.00013	0.0027	0.062
Leafy Vegetables (locally produced)	0.00018	0.0022	0.024
Eggs (locally produced)	0.0084	0.13	1.7
Cottage Cheese (locally produced)	0.00043	0.01	0.24
Inhalation	0.0044	0.026	0.14
Mother's milk (mother on Diet 1)	0.0063	0.19	6.1
Prenatal exposure (mother on Diet 1)	0.058	0.62	7.8
Diet 1	0.24	3.5	40
Diet 2	0.15	1.5	14
Diet 3	0.032	0.25	2.4

Excess Lifetime Risk [ ]			
Diet 1	4.0E-05	1.0E-03	2.2E-02
Diet 2	2.5E-05	4.6E-04	7.8E-03
Diet 3	5.2E-06	8.2E-05	1.3E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.016	1.25	6.6
Diet 2	1.0069	1.11	3.2
Diet 3	1.0013	1.019	1.38
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	1.54	19.9	85
Diet 2	0.68	9.8	68
Diet 3	0.13	1.9	28
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hope Creek**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.22	3.4	40
Commercial Milk (locally produced)	0.088	1.2	12
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.00011	0.0026	0.065
Leafy Vegetables (locally produced)	0.00012	0.0021	0.026
Eggs (locally produced)	0.0089	0.14	1.9
Cottage Cheese (locally produced)	0.00048	0.01	0.2
Inhalation	0.0051	0.027	0.14
Mother's milk (mother on Diet 1)	0.0063	0.19	6.1
Prenatal exposure (mother on Diet 1)	0.058	0.62	7.8
Diet 1	0.25	3.5	43
Diet 2	0.14	1.5	13
Diet 3	0.032	0.26	2.3

Excess Lifetime Risk [ ]			
Diet 1	7.6E-06	2.4E-04	9.4E-03
Diet 2	3.4E-06	1.1E-04	2.9E-03
Diet 3	6.6E-07	1.9E-05	5.7E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.0076	1.2	7.4
Diet 2	1.0034	1.074	3.5
Diet 3	1.0007	1.013	1.37
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.76	16.9	86
Diet 2	0.34	6.9	71
Diet 3	0.07	1.3	27
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.21	3.2	37
Commercial Milk (locally produced)	0.084	1.2	12
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.63	12	190
Beef (locally produced)	0.00013	0.0027	0.06
Leafy Vegetables (locally produced)	0.00017	0.0021	0.023
Eggs (locally produced)	0.0084	0.13	1.6
Cottage Cheese (locally produced)	0.00041	0.01	0.23
Inhalation	0.0044	0.027	0.14
Mother's milk (mother on Diet 1)	0.0061	0.19	5.9
Prenatal exposure (mother on Diet 1)	0.059	0.61	7.6
Diet 1	0.24	3.4	39
Diet 2	0.14	1.5	14
Diet 3	0.033	0.25	2.4

Excess Lifetime Risk [ ]			
Diet 1	4.0E-05	9.9E-04	2.1E-02
Diet 2	2.6E-05	4.5E-04	7.8E-03
Diet 3	5.2E-06	8.2E-05	1.3E-03
Diet 4	1.2E-04	4.0E-03	1.1E-01

Relative Risk [ ]			
Diet 1	1.016	1.25	6.7
Diet 2	1.0071	1.11	3.1
Diet 3	1.0013	1.019	1.38
Diet 4	1.042	1.92	24

Probability of Causation [%]			
Diet 1	1.56	19.9	85
Diet 2	0.71	9.6	68
Diet 3	0.13	1.9	28
Diet 4	3.99	47.6	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Buttermilk Rd.**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.21	3.3	38
Commercial Milk (locally produced)	0.084	1.2	11
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.89	12	210
Beef (locally produced)	0.00011	0.0025	0.065
Leafy Vegetables (locally produced)	0.00012	0.0021	0.024
Eggs (locally produced)	0.0088	0.14	1.8
Cottage Cheese (locally produced)	0.00046	0.01	0.19
Inhalation	0.0051	0.027	0.14
Mother's milk (mother on Diet 1)	0.0061	0.19	5.9
Prenatal exposure (mother on Diet 1)	0.059	0.61	7.6
Diet 1	0.24	3.5	41
Diet 2	0.14	1.4	13
Diet 3	0.031	0.26	2.3

Excess Lifetime Risk [ ]			
Diet 1	7.0E-06	2.4E-04	8.9E-03
Diet 2	3.3E-06	1.1E-04	2.9E-03
Diet 3	6.6E-07	1.9E-05	5.7E-04
Diet 4	2.3E-05	9.0E-04	3.7E-02

Relative Risk [ ]			
Diet 1	1.0072	1.2	7.1
Diet 2	1.0034	1.072	3.5
Diet 3	1.0007	1.013	1.37
Diet 4	1.021	1.71	31

Probability of Causation [%]			
Diet 1	0.71	16.4	85
Diet 2	0.34	6.7	71
Diet 3	0.07	1.3	27
Diet 4	2.04	41.4	97

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.028	0.45	6.1
Commercial Milk (locally produced)	0.012	0.17	1.9
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.091	1.8	30
Beef (locally produced)	0.000016	0.00036	0.0093
Leafy Vegetables (locally produced)	0.000022	0.00031	0.0039
Eggs (locally produced)	0.0012	0.019	0.27
Cottage Cheese (locally produced)	0.000057	0.0015	0.035
Inhalation	0.00071	0.004	0.025
Mother's milk (mother on Diet 1)	0.00087	0.026	0.86
Prenatal exposure (mother on Diet 1)	0.0085	0.09	1.1
Diet 1	0.032	0.49	6.4
Diet 2	0.02	0.21	2.2
Diet 3	0.021	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	5.9E-06	1.4E-04	3.4E-03
Diet 2	3.1E-06	6.5E-05	1.2E-03
Diet 3	4.2E-06	7.1E-05	1.2E-03
Diet 4	1.6E-05	6.2E-04	1.7E-02

Relative Risk [ ]			
Diet 1	1.0025	1.036	1.94
Diet 2	1.0011	1.015	1.3
Diet 3	1.00094	1.017	1.37
Diet 4	1.005	1.13	4.5

Probability of Causation [%]			
Diet 1	0.25	3.5	48
Diet 2	0.11	1.5	23
Diet 3	0.09	1.7	27
Diet 4	0.50	11.4	77

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Jonesville**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.029	0.45	6.2
Commercial Milk (locally produced)	0.01	0.17	1.7
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.12	1.8	33
Beef (locally produced)	0.000017	0.00037	0.0092
Leafy Vegetables (locally produced)	0.000017	0.00029	0.0039
Eggs (locally produced)	0.0014	0.02	0.25
Cottage Cheese (locally produced)	0.000075	0.0015	0.026
Inhalation	0.00076	0.0039	0.023
Mother's milk (mother on Diet 1)	0.00087	0.026	0.86
Prenatal exposure (mother on Diet 1)	0.0085	0.09	1.1
Diet 1	0.035	0.49	6.5
Diet 2	0.019	0.21	2
Diet 3	0.019	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	9.7E-07	3.5E-05	1.4E-03
Diet 2	4.6E-07	1.5E-05	4.9E-04
Diet 3	5.7E-07	1.7E-05	5.4E-04
Diet 4	3.0E-06	1.3E-04	5.8E-03

Relative Risk [ ]			
Diet 1	1.0011	1.029	1.94
Diet 2	1.00052	1.012	1.33
Diet 3	1.00053	1.012	1.36
Diet 4	1.0029	1.11	5.6

Probability of Causation [%]			
Diet 1	0.11	2.8	48
Diet 2	0.05	1.2	25
Diet 3	0.05	1.2	26
Diet 4	0.29	9.6	82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.0003	0.0077	0.17
Inhalation	0.0033	0.02	0.11
Mother's milk (mother on Diet 3)	0.00083	0.014	0.21
Prenatal exposure (mother on Diet 3)	0.0068	0.043	0.31
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.03	0.24	2.4

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	4.8E-06	7.8E-05	1.2E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0012	1.019	1.38
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.12	1.8	28
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Scarborough**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.00033	0.0077	0.14
Inhalation	0.0038	0.02	0.11
Mother's milk (mother on Diet 3)	0.00083	0.014	0.21
Prenatal exposure (mother on Diet 3)	0.0068	0.043	0.31
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.028	0.25	2.2

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	6.4E-07	1.8E-05	5.6E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00065	1.013	1.37
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.07	1.3	27
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.23	3.1	34
Commercial Milk (locally produced)	0.088	1.1	12
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.68	12	170
Beef (locally produced)	0.00012	0.0026	0.062
Leafy Vegetables (locally produced)	0.00015	0.002	0.021
Eggs (locally produced)	0.008	0.13	1.4
Cottage Cheese (locally produced)	0.00038	0.0096	0.22
Inhalation	0.0044	0.026	0.14
Mother's milk (mother on Diet 1)	0.006	0.18	6
Prenatal exposure (mother on Diet 1)	0.063	0.6	7.3
Diet 1	0.27	3.3	36
Diet 2	0.14	1.4	14
Diet 3	0.033	0.25	2.4

Excess Lifetime Risk [ ]			
Diet 1	4.4E-05	9.6E-04	1.9E-02
Diet 2	2.7E-05	4.2E-04	8.1E-03
Diet 3	5.2E-06	8.2E-05	1.3E-03
Diet 4	1.2E-04	3.8E-03	1.1E-01

Relative Risk [ ]			
Diet 1	1.015	1.24	6.4
Diet 2	1.0071	1.1	3
Diet 3	1.0013	1.019	1.38
Diet 4	1.042	1.88	22

Probability of Causation [%]			
Diet 1	1.49	19.6	84
Diet 2	0.71	9.1	67
Diet 3	0.13	1.9	28
Diet 4	4.00	46.7	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lawnville/Gallaher**  
**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.21	3.1	37
Commercial Milk (locally produced)	0.087	1.1	11
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.88	12	210
Beef (locally produced)	0.00011	0.0023	0.062
Leafy Vegetables (locally produced)	0.00012	0.002	0.023
Eggs (locally produced)	0.0094	0.12	1.6
Cottage Cheese (locally produced)	0.00044	0.0098	0.17
Inhalation	0.005	0.026	0.15
Mother's milk (mother on Diet 1)	0.006	0.18	6
Prenatal exposure (mother on Diet 1)	0.063	0.6	7.3
Diet 1	0.24	3.3	39
Diet 2	0.14	1.4	14
Diet 3	0.032	0.26	2.3

Excess Lifetime Risk [ ]			
Diet 1	7.5E-06	2.5E-04	7.8E-03
Diet 2	3.4E-06	1.0E-04	3.1E-03
Diet 3	6.7E-07	1.9E-05	5.8E-04
Diet 4	2.3E-05	8.6E-04	4.0E-02

Relative Risk [ ]			
Diet 1	1.0071	1.19	7.2
Diet 2	1.0033	1.071	3
Diet 3	1.0007	1.013	1.37
Diet 4	1.021	1.64	27

Probability of Causation [%]			
Diet 1	0.71	15.6	86
Diet 2	0.33	6.6	67
Diet 3	0.07	1.3	27
Diet 4	2.01	39.1	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.045	0.65	8.9
Commercial Milk (locally produced)	0.016	0.22	2.9
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.13	2.4	37
Beef (locally produced)	0.000023	0.0005	0.013
Leafy Vegetables (locally produced)	0.000032	0.00043	0.0052
Eggs (locally produced)	0.0014	0.026	0.38
Cottage Cheese (locally produced)	0.000085	0.0019	0.046
Inhalation	0.00094	0.0055	0.031
Mother's milk (mother on Diet 1)	0.0013	0.035	1.4
Prenatal exposure (mother on Diet 1)	0.011	0.12	1.5
Diet 1	0.051	0.7	9.3
Diet 2	0.026	0.28	3.2
Diet 3	0.022	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	8.4E-06	2.0E-04	4.3E-03
Diet 2	4.0E-06	8.9E-05	1.8E-03
Diet 3	4.2E-06	7.1E-05	1.2E-03
Diet 4	2.0E-05	7.7E-04	2.2E-02

Relative Risk [ ]			
Diet 1	1.0034	1.047	2.3
Diet 2	1.0014	1.021	1.42
Diet 3	1.00098	1.017	1.37
Diet 4	1.0063	1.18	5

Probability of Causation [%]			
Diet 1	0.34	4.5	57
Diet 2	0.14	2.0	29
Diet 3	0.10	1.7	27
Diet 4	0.63	14.9	80

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dyllis**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.038	0.61	7.9
Commercial Milk (locally produced)	0.016	0.23	2.4
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.15	2.5	39
Beef (locally produced)	0.000023	0.00049	0.013
Leafy Vegetables (locally produced)	0.000023	0.00039	0.0053
Eggs (locally produced)	0.0016	0.024	0.34
Cottage Cheese (locally produced)	0.000088	0.0021	0.04
Inhalation	0.0011	0.0054	0.031
Mother's milk (mother on Diet 1)	0.0013	0.035	1.4
Prenatal exposure (mother on Diet 1)	0.011	0.12	1.5
Diet 1	0.044	0.66	8.2
Diet 2	0.026	0.28	2.6
Diet 3	0.02	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	1.6E-06	4.7E-05	1.8E-03
Diet 2	6.2E-07	2.1E-05	5.7E-04
Diet 3	5.9E-07	1.7E-05	5.4E-04
Diet 4	5.0E-06	1.8E-04	8.8E-03

Relative Risk [ ]			
Diet 1	1.0015	1.038	2.2
Diet 2	1.00071	1.015	1.39
Diet 3	1.00054	1.012	1.36
Diet 4	1.0037	1.14	7.1

Probability of Causation [%]			
Diet 1	0.15	3.7	54
Diet 2	0.07	1.5	28
Diet 3	0.05	1.2	26
Diet 4	0.37	12.2	86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.00019	0.0043	0.093
Inhalation	0.0019	0.012	0.063
Mother's milk (mother on Diet 3)	0.00071	0.012	0.19
Prenatal exposure (mother on Diet 3)	0.0054	0.035	0.28
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.026	0.24	2.4

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	4.4E-06	7.4E-05	1.2E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0011	1.018	1.38
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.11	1.8	27
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR High School Area**  
**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.00022	0.0043	0.075
Inhalation	0.0023	0.012	0.063
Mother's milk (mother on Diet 3)	0.00071	0.012	0.19
Prenatal exposure (mother on Diet 3)	0.0054	0.035	0.28
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.025	0.25	2.2

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	6.2E-07	1.8E-05	5.5E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0006	1.012	1.36
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.06	1.2	27
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways  
Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways  
Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)  
Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.037	0.58	7.9
Commercial Milk (locally produced)	0.015	0.21	3.4
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.13	2.3	38
Beef (locally produced)	0.000021	0.00046	0.012
Leafy Vegetables (locally produced)	0.000026	0.00039	0.0042
Eggs (locally produced)	0.0015	0.024	0.36
Cottage Cheese (locally produced)	0.00008	0.0019	0.049
Inhalation	0.00085	0.0052	0.03
Mother's milk (mother on Diet 1)	0.0011	0.034	1.3
Prenatal exposure (mother on Diet 1)	0.01	0.12	1.5
Diet 1	0.043	0.62	8.6
Diet 2	0.025	0.26	3.7
Diet 3	0.022	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	7.8E-06	1.9E-04	4.7E-03
Diet 2	3.8E-06	8.3E-05	1.8E-03
Diet 3	4.2E-06	7.2E-05	1.2E-03
Diet 4	2.1E-05	7.6E-04	2.2E-02

Relative Risk [ ]			
Diet 1	1.003	1.048	2.1
Diet 2	1.0012	1.019	1.49
Diet 3	1.00096	1.017	1.37
Diet 4	1.0069	1.16	5.1

Probability of Causation [%]			
Diet 1	0.30	4.6	51
Diet 2	0.12	1.8	33
Diet 3	0.10	1.7	27
Diet 4	0.69	13.7	80

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Norwood**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.035	0.6	8.2
Commercial Milk (locally produced)	0.014	0.22	2.4
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.13	2.2	45
Beef (locally produced)	0.000022	0.00044	0.013
Leafy Vegetables (locally produced)	0.000022	0.00039	0.0051
Eggs (locally produced)	0.0016	0.026	0.34
Cottage Cheese (locally produced)	0.000078	0.0019	0.036
Inhalation	0.00095	0.0051	0.027
Mother's milk (mother on Diet 1)	0.0011	0.034	1.3
Prenatal exposure (mother on Diet 1)	0.01	0.12	1.5
Diet 1	0.04	0.65	8.7
Diet 2	0.024	0.27	2.7
Diet 3	0.02	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	1.4E-06	4.4E-05	1.8E-03
Diet 2	6.1E-07	1.9E-05	6.7E-04
Diet 3	5.8E-07	1.7E-05	5.4E-04
Diet 4	4.3E-06	1.7E-04	7.1E-03

Relative Risk [ ]			
Diet 1	1.0013	1.036	2.2
Diet 2	1.00067	1.013	1.39
Diet 3	1.00054	1.012	1.36
Diet 4	1.0037	1.13	6.3

Probability of Causation [%]			
Diet 1	0.13	3.5	54
Diet 2	0.07	1.3	28
Diet 3	0.05	1.2	26
Diet 4	0.37	11.3	84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.00027	0.0064	0.14
Inhalation	0.0029	0.017	0.093
Mother's milk (mother on Diet 3)	0.00078	0.014	0.2
Prenatal exposure (mother on Diet 3)	0.0065	0.041	0.3
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.029	0.24	2.4

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	4.8E-06	7.7E-05	1.2E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.0012	1.018	1.38
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.12	1.8	27
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Woodland**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.00032	0.0065	0.11
Inhalation	0.0034	0.017	0.094
Mother's milk (mother on Diet 3)	0.00078	0.014	0.2
Prenatal exposure (mother on Diet 3)	0.0065	0.041	0.3
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.028	0.25	2.2

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	6.4E-07	1.8E-05	5.6E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00065	1.013	1.37
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.07	1.3	27
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.2	2.9	33
Commercial Milk (locally produced)	0.079	1	11
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.6	11	160
Beef (locally produced)	0.00012	0.0024	0.058
Leafy Vegetables (locally produced)	0.00015	0.0019	0.021
Eggs (locally produced)	0.0071	0.12	1.5
Cottage Cheese (locally produced)	0.00035	0.0093	0.2
Inhalation	0.0044	0.026	0.14
Mother's milk (mother on Diet 1)	0.006	0.16	5.8
Prenatal exposure (mother on Diet 1)	0.051	0.55	6.9
Diet 1	0.23	3.2	35
Diet 2	0.13	1.3	13
Diet 3	0.032	0.25	2.4

Excess Lifetime Risk [ ]			
Diet 1	3.6E-05	8.9E-04	1.9E-02
Diet 2	2.0E-05	4.0E-04	7.8E-03
Diet 3	5.1E-06	8.2E-05	1.3E-03
Diet 4	1.1E-04	3.6E-03	9.9E-02

Relative Risk [ ]			
Diet 1	1.015	1.23	6.1
Diet 2	1.0067	1.094	2.8
Diet 3	1.0013	1.019	1.38
Diet 4	1.034	1.85	19

Probability of Causation [%]			
Diet 1	1.49	18.7	83
Diet 2	0.66	8.5	64
Diet 3	0.13	1.9	28
Diet 4	3.32	46.0	95

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hardin Valley**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.18	2.9	34
Commercial Milk (locally produced)	0.071	1.1	9.9
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.79	11	190
Beef (locally produced)	0.00011	0.0023	0.058
Leafy Vegetables (locally produced)	0.00011	0.0018	0.022
Eggs (locally produced)	0.0081	0.12	1.5
Cottage Cheese (locally produced)	0.00044	0.0095	0.17
Inhalation	0.0049	0.026	0.14
Mother's milk (mother on Diet 1)	0.006	0.16	5.8
Prenatal exposure (mother on Diet 1)	0.051	0.55	6.9
Diet 1	0.2	3.1	36
Diet 2	0.13	1.3	11
Diet 3	0.032	0.26	2.3

Excess Lifetime Risk [ ]			
Diet 1	7.5E-06	2.2E-04	7.6E-03
Diet 2	3.1E-06	9.6E-05	2.5E-03
Diet 3	6.6E-07	1.9E-05	5.7E-04
Diet 4	2.3E-05	8.6E-04	3.6E-02

Relative Risk [ ]			
Diet 1	1.0074	1.18	6.5
Diet 2	1.0034	1.069	2.9
Diet 3	1.00072	1.013	1.37
Diet 4	1.018	1.63	28

Probability of Causation [%]			
Diet 1	0.73	15.0	84
Diet 2	0.34	6.4	66
Diet 3	0.07	1.3	27
Diet 4	1.79	38.5	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.03	0.44	5.5
Commercial Milk (locally produced)	0.012	0.16	2.1
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.1	1.8	29
Beef (locally produced)	0.000015	0.00036	0.0096
Leafy Vegetables (locally produced)	0.000021	0.00029	0.0033
Eggs (locally produced)	0.0011	0.018	0.27
Cottage Cheese (locally produced)	0.000068	0.0015	0.031
Inhalation	0.00065	0.004	0.024
Mother's milk (mother on Diet 1)	0.00085	0.025	0.96
Prenatal exposure (mother on Diet 1)	0.0085	0.088	1.3
Diet 1	0.035	0.47	5.9
Diet 2	0.02	0.2	2.4
Diet 3	0.021	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	5.6E-06	1.4E-04	3.9E-03
Diet 2	3.3E-06	6.3E-05	1.2E-03
Diet 3	4.2E-06	7.1E-05	1.2E-03
Diet 4	1.6E-05	5.8E-04	1.6E-02

Relative Risk [ ]			
Diet 1	1.0023	1.035	1.86
Diet 2	1.00094	1.015	1.3
Diet 3	1.00095	1.017	1.37
Diet 4	1.0053	1.12	4

Probability of Causation [%]			
Diet 1	0.23	3.3	46
Diet 2	0.09	1.5	23
Diet 3	0.10	1.7	27
Diet 4	0.52	10.9	75

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oliver Springs**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.027	0.45	6.3
Commercial Milk (locally produced)	0.01	0.16	2
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.11	1.7	34
Beef (locally produced)	0.000016	0.00036	0.01
Leafy Vegetables (locally produced)	0.000018	0.00029	0.004
Eggs (locally produced)	0.0013	0.018	0.27
Cottage Cheese (locally produced)	0.000068	0.0014	0.026
Inhalation	0.00075	0.004	0.022
Mother's milk (mother on Diet 1)	0.00085	0.025	0.96
Prenatal exposure (mother on Diet 1)	0.0085	0.088	1.3
Diet 1	0.032	0.48	6.7
Diet 2	0.019	0.2	2.2
Diet 3	0.019	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	1.0E-06	3.5E-05	1.4E-03
Diet 2	4.7E-07	1.5E-05	4.3E-04
Diet 3	5.8E-07	1.7E-05	5.4E-04
Diet 4	3.3E-06	1.3E-04	5.1E-03

Relative Risk [ ]			
Diet 1	1.0011	1.028	1.98
Diet 2	1.0005	1.011	1.3
Diet 3	1.00053	1.012	1.36
Diet 4	1.0025	1.098	4.9

Probability of Causation [%]			
Diet 1	0.11	2.7	49
Diet 2	0.05	1.0	23
Diet 3	0.05	1.2	26
Diet 4	0.25	8.9	79

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.18	2.5	31
Commercial Milk (locally produced)	0.073	0.94	9.5
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.54	10	150
Beef (locally produced)	0.000098	0.0022	0.052
Leafy Vegetables (locally produced)	0.00014	0.0018	0.019
Eggs (locally produced)	0.0063	0.11	1.3
Cottage Cheese (locally produced)	0.00034	0.0084	0.18
Inhalation	0.0041	0.024	0.13
Mother's milk (mother on Diet 1)	0.0052	0.15	4.6
Prenatal exposure (mother on Diet 1)	0.047	0.51	5.9
Diet 1	0.21	2.7	33
Diet 2	0.13	1.2	11
Diet 3	0.033	0.25	2.4

Excess Lifetime Risk [ ]			
Diet 1	3.5E-05	8.1E-04	1.8E-02
Diet 2	1.9E-05	3.7E-04	6.4E-03
Diet 3	5.0E-06	8.1E-05	1.3E-03
Diet 4	1.1E-04	3.4E-03	8.7E-02

Relative Risk [ ]			
Diet 1	1.014	1.21	5.8
Diet 2	1.0062	1.085	2.8
Diet 3	1.0013	1.019	1.38
Diet 4	1.033	1.73	19

Probability of Causation [%]			
Diet 1	1.37	17.1	83
Diet 2	0.61	7.8	64
Diet 3	0.13	1.9	28
Diet 4	3.20	42.2	95

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Solway**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.18	2.7	30
Commercial Milk (locally produced)	0.068	0.99	9
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.73	9.8	170
Beef (locally produced)	0.000097	0.0021	0.052
Leafy Vegetables (locally produced)	0.00011	0.0017	0.019
Eggs (locally produced)	0.0078	0.11	1.5
Cottage Cheese (locally produced)	0.00041	0.0086	0.15
Inhalation	0.0047	0.024	0.12
Mother's milk (mother on Diet 1)	0.0052	0.15	4.6
Prenatal exposure (mother on Diet 1)	0.047	0.51	5.9
Diet 1	0.2	2.8	32
Diet 2	0.12	1.2	10
Diet 3	0.03	0.26	2.2

Excess Lifetime Risk [ ]			
Diet 1	6.7E-06	2.0E-04	7.0E-03
Diet 2	2.8E-06	8.8E-05	2.4E-03
Diet 3	6.6E-07	1.9E-05	5.7E-04
Diet 4	1.9E-05	7.7E-04	3.3E-02

Relative Risk [ ]			
Diet 1	1.0059	1.16	5.9
Diet 2	1.0029	1.061	2.8
Diet 3	1.0007	1.013	1.37
Diet 4	1.018	1.58	25

Probability of Causation [%]			
Diet 1	0.59	13.8	83
Diet 2	0.29	5.8	64
Diet 3	0.07	1.3	27
Diet 4	1.74	36.6	96

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.079	1.1	13
Commercial Milk (locally produced)	0.032	0.4	4.4
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.23	4.3	65
Beef (locally produced)	0.000042	0.00091	0.022
Leafy Vegetables (locally produced)	0.000057	0.00072	0.0082
Eggs (locally produced)	0.0027	0.045	0.59
Cottage Cheese (locally produced)	0.00014	0.0036	0.08
Inhalation	0.0017	0.01	0.054
Mother's milk (mother on Diet 1)	0.0023	0.063	2.1
Prenatal exposure (mother on Diet 1)	0.02	0.21	2.7
Diet 1	0.09	1.2	14
Diet 2	0.052	0.5	5.1
Diet 3	0.025	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	1.4E-05	3.4E-04	8.0E-03
Diet 2	7.7E-06	1.5E-04	2.9E-03
Diet 3	4.3E-06	7.3E-05	1.2E-03
Diet 4	4.5E-05	1.4E-03	3.6E-02

Relative Risk [ ]			
Diet 1	1.0057	1.088	3.1
Diet 2	1.0025	1.036	1.71
Diet 3	1.001	1.018	1.38
Diet 4	1.014	1.31	7.9

Probability of Causation [%]			
Diet 1	0.57	8.0	66
Diet 2	0.25	3.4	40
Diet 3	0.10	1.7	27
Diet 4	1.35	23.2	86

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways  
Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways  
Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)  
Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sugar Grove**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.073	1.1	13
Commercial Milk (locally produced)	0.028	0.41	4
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.31	4.2	74
Beef (locally produced)	0.000044	0.00089	0.022
Leafy Vegetables (locally produced)	0.000043	0.0007	0.0087
Eggs (locally produced)	0.0031	0.046	0.61
Cottage Cheese (locally produced)	0.00018	0.0035	0.067
Inhalation	0.0019	0.0098	0.052
Mother's milk (mother on Diet 1)	0.0023	0.063	2.1
Prenatal exposure (mother on Diet 1)	0.02	0.21	2.7
Diet 1	0.083	1.2	14
Diet 2	0.051	0.5	4.6
Diet 3	0.023	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	2.9E-06	8.6E-05	2.9E-03
Diet 2	1.3E-06	3.6E-05	1.0E-03
Diet 3	6.1E-07	1.8E-05	5.5E-04
Diet 4	8.7E-06	3.2E-04	1.4E-02

Relative Risk [ ]			
Diet 1	1.0027	1.068	3.1
Diet 2	1.0013	1.027	1.78
Diet 3	1.00057	1.012	1.36
Diet 4	1.007	1.24	10.6

Probability of Causation [%]			
Diet 1	0.27	6.3	65
Diet 2	0.13	2.6	43
Diet 3	0.06	1.2	26
Diet 4	0.69	19.1	89

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.00015	0.0038	0.084
Inhalation	0.0018	0.011	0.057
Mother's milk (mother on Diet 3)	0.00066	0.012	0.19
Prenatal exposure (mother on Diet 3)	0.0051	0.035	0.28
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.025	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	4.4E-06	7.4E-05	1.2E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.001	1.018	1.38
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.10	1.8	27
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: OR Townsite**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	--	--	--
Commercial Milk (locally produced)	--	--	--
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	--	--	--
Leafy Vegetables (locally produced)	--	--	--
Eggs (locally produced)	--	--	--
Cottage Cheese (locally produced)	0.00018	0.0039	0.07
Inhalation	0.0021	0.011	0.056
Mother's milk (mother on Diet 3)	0.00066	0.012	0.19
Prenatal exposure (mother on Diet 3)	0.0051	0.035	0.28
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.024	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	6.1E-07	1.8E-05	5.5E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	1.00059	1.012	1.36
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	--	--	--
Diet 2	--	--	--
Diet 3	0.06	1.2	27
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.087	1.3	14
Commercial Milk (locally produced)	0.037	0.48	5.7
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.28	5	79
Beef (locally produced)	0.00005	0.0011	0.025
Leafy Vegetables (locally produced)	0.000073	0.00091	0.0094
Eggs (locally produced)	0.0036	0.055	0.69
Cottage Cheese (locally produced)	0.00019	0.0042	0.098
Inhalation	0.0021	0.013	0.067
Mother's milk (mother on Diet 1)	0.0027	0.082	2.5
Prenatal exposure (mother on Diet 1)	0.025	0.26	3.2
Diet 1	0.1	1.4	15
Diet 2	0.063	0.6	6.3
Diet 3	0.026	0.24	2.4

Excess Lifetime Risk [ ]			
Diet 1	1.8E-05	4.3E-04	9.9E-03
Diet 2	9.9E-06	1.9E-04	3.3E-03
Diet 3	4.5E-06	7.5E-05	1.2E-03
Diet 4	5.2E-05	1.7E-03	4.5E-02

Relative Risk [ ]			
Diet 1	1.0067	1.1	3.1
Diet 2	1.003	1.044	1.76
Diet 3	1.0011	1.018	1.38
Diet 4	1.019	1.39	9.7

Probability of Causation [%]			
Diet 1	0.67	9.4	67
Diet 2	0.30	4.2	43
Diet 3	0.11	1.8	27
Diet 4	1.84	27.8	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Hines Valley**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.093	1.4	16
Commercial Milk (locally produced)	0.038	0.49	4.7
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.38	5	90
Beef (locally produced)	0.000046	0.0011	0.026
Leafy Vegetables (locally produced)	0.000051	0.00083	0.011
Eggs (locally produced)	0.0039	0.057	0.78
Cottage Cheese (locally produced)	0.00022	0.0043	0.086
Inhalation	0.0025	0.013	0.067
Mother's milk (mother on Diet 1)	0.0027	0.082	2.5
Prenatal exposure (mother on Diet 1)	0.025	0.26	3.2
Diet 1	0.11	1.5	18
Diet 2	0.06	0.6	5.5
Diet 3	0.026	0.25	2.2

Excess Lifetime Risk [ ]			
Diet 1	3.2E-06	1.0E-04	3.9E-03
Diet 2	1.5E-06	4.5E-05	1.2E-03
Diet 3	6.2E-07	1.8E-05	5.5E-04
Diet 4	1.0E-05	3.8E-04	1.4E-02

Relative Risk [ ]			
Diet 1	1.0031	1.084	3.7
Diet 2	1.0014	1.031	1.99
Diet 3	1.00061	1.012	1.36
Diet 4	1.0086	1.29	13

Probability of Causation [%]			
Diet 1	0.31	7.8	73
Diet 2	0.14	3.0	50
Diet 3	0.06	1.2	27
Diet 4	0.85	22.4	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.1	1.5	17
Commercial Milk (locally produced)	0.043	0.55	6.4
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.33	5.8	86
Beef (locally produced)	0.000061	0.0012	0.03
Leafy Vegetables (locally produced)	0.000077	0.001	0.01
Eggs (locally produced)	0.0036	0.063	0.84
Cottage Cheese (locally produced)	0.0002	0.0048	0.097
Inhalation	0.0024	0.015	0.081
Mother's milk (mother on Diet 1)	0.0031	0.087	3.3
Prenatal exposure (mother on Diet 1)	0.027	0.3	3.5
Diet 1	0.12	1.6	18
Diet 2	0.073	0.67	6.9
Diet 3	0.028	0.24	2.4

Excess Lifetime Risk [ ]			
Diet 1	2.1E-05	4.6E-04	1.2E-02
Diet 2	1.1E-05	2.1E-04	3.8E-03
Diet 3	4.4E-06	7.6E-05	1.2E-03
Diet 4	6.0E-05	2.0E-03	5.3E-02

Relative Risk [ ]			
Diet 1	1.0079	1.12	3.6
Diet 2	1.0031	1.051	2
Diet 3	1.0011	1.018	1.38
Diet 4	1.017	1.43	12

Probability of Causation [%]			
Diet 1	0.79	10.5	72
Diet 2	0.31	4.8	50
Diet 3	0.11	1.8	27
Diet 4	1.63	30.1	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Farragut**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.11	1.5	18
Commercial Milk (locally produced)	0.041	0.55	5.1
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.4	5.8	110
Beef (locally produced)	0.000057	0.0012	0.031
Leafy Vegetables (locally produced)	0.000057	0.00097	0.012
Eggs (locally produced)	0.0048	0.064	0.83
Cottage Cheese (locally produced)	0.00024	0.0049	0.085
Inhalation	0.0027	0.015	0.077
Mother's milk (mother on Diet 1)	0.0031	0.087	3.3
Prenatal exposure (mother on Diet 1)	0.027	0.3	3.5
Diet 1	0.13	1.7	19
Diet 2	0.064	0.68	5.9
Diet 3	0.026	0.25	2.2

Excess Lifetime Risk [ ]			
Diet 1	3.8E-06	1.1E-04	4.5E-03
Diet 2	1.7E-06	5.2E-05	1.5E-03
Diet 3	6.3E-07	1.8E-05	5.6E-04
Diet 4	1.1E-05	4.1E-04	1.8E-02

Relative Risk [ ]			
Diet 1	1.0038	1.089	3.9
Diet 2	1.0017	1.035	2.1
Diet 3	1.00062	1.012	1.36
Diet 4	1.0088	1.33	15

Probability of Causation [%]			
Diet 1	0.38	8.2	74
Diet 2	0.17	3.4	51
Diet 3	0.06	1.2	27
Diet 4	0.87	24.7	93

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.071	0.96	9.8
Commercial Milk (locally produced)	0.026	0.33	4.2
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.000032	0.0008	0.02
Leafy Vegetables (locally produced)	0.000048	0.00064	0.0063
Eggs (locally produced)	0.0023	0.04	0.41
Cottage Cheese (locally produced)	0.00012	0.0029	0.073
Inhalation	0.0016	0.009	0.052
Mother's milk (mother on Diet 1)	0.0019	0.053	1.7
Prenatal exposure (mother on Diet 1)	0.02	0.18	2.2
Diet 1	0.082	1	10
Diet 2	0.039	0.41	4.4
Diet 3	0.024	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	1.2E-05	2.9E-04	6.3E-03
Diet 2	8.2E-06	1.3E-04	2.5E-03
Diet 3	4.3E-06	7.2E-05	1.2E-03
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.0047	1.073	2.6
Diet 2	1.0022	1.03	1.6
Diet 3	1.001	1.018	1.38
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.46	6.8	62
Diet 2	0.22	2.9	37
Diet 3	0.10	1.7	27
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lenoir City**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.058	0.94	10
Commercial Milk (locally produced)	0.028	0.34	3.5
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	--	--	--
Beef (locally produced)	0.000034	0.00072	0.02
Leafy Vegetables (locally produced)	0.000036	0.00063	0.0078
Eggs (locally produced)	0.0029	0.037	0.46
Cottage Cheese (locally produced)	0.00014	0.0029	0.053
Inhalation	0.0017	0.009	0.053
Mother's milk (mother on Diet 1)	0.0019	0.053	1.7
Prenatal exposure (mother on Diet 1)	0.02	0.18	2.2
Diet 1	0.074	1	11
Diet 2	0.043	0.42	3.8
Diet 3	0.023	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	2.1E-06	7.5E-05	2.6E-03
Diet 2	1.1E-06	3.0E-05	9.0E-04
Diet 3	6.1E-07	1.7E-05	5.5E-04
Diet 4	--	--	--

Relative Risk [ ]			
Diet 1	1.0023	1.058	2.7
Diet 2	1.00098	1.022	1.55
Diet 3	1.0006	1.012	1.36
Diet 4	--	--	--

Probability of Causation [%]			
Diet 1	0.23	5.5	63
Diet 2	0.10	2.2	35
Diet 3	0.06	1.2	26
Diet 4	--	--	--

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.086	1.1	12
Commercial Milk (locally produced)	0.032	0.42	5.4
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.27	4.6	69
Beef (locally produced)	0.000045	0.001	0.024
Leafy Vegetables (locally produced)	0.00006	0.00076	0.0077
Eggs (locally produced)	0.003	0.049	0.6
Cottage Cheese (locally produced)	0.00015	0.0038	0.085
Inhalation	0.0021	0.012	0.066
Mother's milk (mother on Diet 1)	0.0026	0.068	2.2
Prenatal exposure (mother on Diet 1)	0.021	0.23	3
Diet 1	0.097	1.2	13
Diet 2	0.055	0.53	6.2
Diet 3	0.026	0.24	2.4

Excess Lifetime Risk [ ]			
Diet 1	1.6E-05	3.9E-04	8.8E-03
Diet 2	8.5E-06	1.6E-04	3.0E-03
Diet 3	4.4E-06	7.4E-05	1.2E-03
Diet 4	5.0E-05	1.5E-03	3.7E-02

Relative Risk [ ]			
Diet 1	1.0065	1.091	3
Diet 2	1.0027	1.039	1.79
Diet 3	1.0011	1.018	1.38
Diet 4	1.015	1.33	8.7

Probability of Causation [%]			
Diet 1	0.64	8.3	66
Diet 2	0.27	3.8	44
Diet 3	0.11	1.8	27
Diet 4	1.47	24.9	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Kingston**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.081	1.2	14
Commercial Milk (locally produced)	0.032	0.43	4.5
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.35	4.5	78
Beef (locally produced)	0.000043	0.00091	0.023
Leafy Vegetables (locally produced)	0.000044	0.00075	0.0097
Eggs (locally produced)	0.0032	0.049	0.64
Cottage Cheese (locally produced)	0.00019	0.0039	0.063
Inhalation	0.0023	0.012	0.066
Mother's milk (mother on Diet 1)	0.0026	0.068	2.2
Prenatal exposure (mother on Diet 1)	0.021	0.23	3
Diet 1	0.09	1.3	15
Diet 2	0.051	0.54	5.1
Diet 3	0.025	0.25	2.2

Excess Lifetime Risk [ ]			
Diet 1	2.9E-06	9.4E-05	2.9E-03
Diet 2	1.2E-06	3.9E-05	1.1E-03
Diet 3	6.2E-07	1.8E-05	5.5E-04
Diet 4	9.6E-06	3.3E-04	1.3E-02

Relative Risk [ ]			
Diet 1	1.0028	1.069	3.4
Diet 2	1.0013	1.027	1.83
Diet 3	1.0006	1.012	1.36
Diet 4	1.0067	1.26	10.2

Probability of Causation [%]			
Diet 1	0.28	6.5	70
Diet 2	0.13	2.6	45
Diet 3	0.06	1.2	27
Diet 4	0.67	20.4	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.11	1.6	17
Commercial Milk (locally produced)	0.045	0.58	6.2
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.36	6.2	84
Beef (locally produced)	0.000065	0.0013	0.028
Leafy Vegetables (locally produced)	0.000087	0.0011	0.01
Eggs (locally produced)	0.004	0.066	0.85
Cottage Cheese (locally produced)	0.0002	0.0052	0.11
Inhalation	0.0027	0.016	0.088
Mother's milk (mother on Diet 1)	0.0032	0.093	3.1
Prenatal exposure (mother on Diet 1)	0.029	0.31	3.7
Diet 1	0.13	1.7	18
Diet 2	0.074	0.74	7
Diet 3	0.028	0.24	2.4

Excess Lifetime Risk [ ]			
Diet 1	2.2E-05	4.9E-04	1.2E-02
Diet 2	1.3E-05	2.2E-04	3.9E-03
Diet 3	4.5E-06	7.7E-05	1.2E-03
Diet 4	6.4E-05	2.0E-03	5.4E-02

Relative Risk [ ]			
Diet 1	1.0092	1.12	3.6
Diet 2	1.0032	1.054	2
Diet 3	1.0011	1.018	1.38
Diet 4	1.02	1.46	12

Probability of Causation [%]			
Diet 1	0.91	10.9	72
Diet 2	0.32	5.1	50
Diet 3	0.11	1.8	27
Diet 4	1.99	31.4	92

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Karns**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.12	1.7	19
Commercial Milk (locally produced)	0.044	0.58	5.3
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.44	6.1	99
Beef (locally produced)	0.000058	0.0013	0.03
Leafy Vegetables (locally produced)	0.000065	0.001	0.012
Eggs (locally produced)	0.0051	0.069	0.89
Cottage Cheese (locally produced)	0.00025	0.0052	0.091
Inhalation	0.0031	0.016	0.084
Mother's milk (mother on Diet 1)	0.0032	0.093	3.1
Prenatal exposure (mother on Diet 1)	0.029	0.31	3.7
Diet 1	0.14	1.8	20
Diet 2	0.074	0.73	6.1
Diet 3	0.027	0.25	2.2

Excess Lifetime Risk [ ]			
Diet 1	4.2E-06	1.2E-04	4.5E-03
Diet 2	1.9E-06	5.4E-05	1.5E-03
Diet 3	6.4E-07	1.8E-05	5.6E-04
Diet 4	1.2E-05	4.4E-04	1.9E-02

Relative Risk [ ]			
Diet 1	1.0038	1.096	4
Diet 2	1.0018	1.037	2.1
Diet 3	1.00064	1.013	1.36
Diet 4	1.01	1.36	15

Probability of Causation [%]			
Diet 1	0.38	8.7	75
Diet 2	0.18	3.6	51
Diet 3	0.06	1.2	27
Diet 4	0.99	26.6	93

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.062	0.85	10
Commercial Milk (locally produced)	0.026	0.32	3.6
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.19	3.6	50
Beef (locally produced)	0.000032	0.00073	0.017
Leafy Vegetables (locally produced)	0.000048	0.0006	0.0063
Eggs (locally produced)	0.0024	0.037	0.5
Cottage Cheese (locally produced)	0.00012	0.0029	0.066
Inhalation	0.0015	0.0094	0.053
Mother's milk (mother on Diet 1)	0.0017	0.052	1.7
Prenatal exposure (mother on Diet 1)	0.017	0.18	2
Diet 1	0.072	0.92	11
Diet 2	0.044	0.4	4.2
Diet 3	0.025	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	1.2E-05	2.8E-04	6.3E-03
Diet 2	6.6E-06	1.3E-04	2.2E-03
Diet 3	4.3E-06	7.3E-05	1.2E-03
Diet 4	3.6E-05	1.2E-03	2.9E-02

Relative Risk [ ]			
Diet 1	1.0044	1.07	2.6
Diet 2	1.0019	1.029	1.59
Diet 3	1.001	1.018	1.38
Diet 4	1.011	1.25	7

Probability of Causation [%]			
Diet 1	0.44	6.5	61
Diet 2	0.19	2.8	37
Diet 3	0.10	1.7	27
Diet 4	1.09	19.9	85

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Loudon**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.064	0.91	11
Commercial Milk (locally produced)	0.023	0.33	3.1
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.26	3.4	58
Beef (locally produced)	0.000036	0.00071	0.018
Leafy Vegetables (locally produced)	0.000035	0.00057	0.0072
Eggs (locally produced)	0.0026	0.038	0.5
Cottage Cheese (locally produced)	0.00014	0.0029	0.052
Inhalation	0.0018	0.0095	0.052
Mother's milk (mother on Diet 1)	0.0017	0.052	1.7
Prenatal exposure (mother on Diet 1)	0.017	0.18	2
Diet 1	0.075	0.99	12
Diet 2	0.041	0.41	3.6
Diet 3	0.023	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	2.2E-06	6.8E-05	2.4E-03
Diet 2	1.1E-06	3.0E-05	8.6E-04
Diet 3	6.1E-07	1.8E-05	5.4E-04
Diet 4	6.6E-06	2.6E-04	1.0E-02

Relative Risk [ ]			
Diet 1	1.0022	1.056	2.7
Diet 2	1.001	1.022	1.63
Diet 3	1.00056	1.012	1.36
Diet 4	1.0058	1.2	8.2

Probability of Causation [%]			
Diet 1	0.22	5.3	62
Diet 2	0.10	2.1	38
Diet 3	0.06	1.2	26
Diet 4	0.57	16.5	88

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.039	0.54	5.6
Commercial Milk (locally produced)	0.015	0.19	2.2
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.13	2	31
Beef (locally produced)	0.000019	0.00046	0.012
Leafy Vegetables (locally produced)	0.000026	0.00037	0.0036
Eggs (locally produced)	0.0013	0.023	0.24
Cottage Cheese (locally produced)	0.000068	0.0017	0.04
Inhalation	0.00087	0.005	0.028
Mother's milk (mother on Diet 1)	0.0011	0.031	0.99
Prenatal exposure (mother on Diet 1)	0.012	0.1	1.3
Diet 1	0.045	0.57	5.9
Diet 2	0.023	0.24	2.4
Diet 3	0.022	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	7.3E-06	1.7E-04	3.6E-03
Diet 2	4.7E-06	7.4E-05	1.4E-03
Diet 3	4.2E-06	7.1E-05	1.2E-03
Diet 4	2.1E-05	6.7E-04	2.0E-02

Relative Risk [ ]			
Diet 1	1.0027	1.042	1.95
Diet 2	1.0012	1.017	1.35
Diet 3	1.00098	1.017	1.37
Diet 4	1.0074	1.15	4.6

Probability of Causation [%]			
Diet 1	0.27	4.0	49
Diet 2	0.13	1.7	26
Diet 3	0.10	1.7	27
Diet 4	0.74	13.2	78

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Harriman**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.033	0.53	5.9
Commercial Milk (locally produced)	0.016	0.2	2
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.15	2.1	37
Beef (locally produced)	0.00002	0.00041	0.011
Leafy Vegetables (locally produced)	0.00002	0.00036	0.0044
Eggs (locally produced)	0.0016	0.021	0.27
Cottage Cheese (locally produced)	0.000083	0.0017	0.03
Inhalation	0.00097	0.005	0.029
Mother's milk (mother on Diet 1)	0.0011	0.031	0.99
Prenatal exposure (mother on Diet 1)	0.012	0.1	1.3
Diet 1	0.042	0.57	6.4
Diet 2	0.024	0.24	2.2
Diet 3	0.02	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	1.2E-06	4.2E-05	1.5E-03
Diet 2	6.1E-07	1.7E-05	5.1E-04
Diet 3	5.8E-07	1.7E-05	5.4E-04
Diet 4	4.0E-06	1.5E-04	7.0E-03

Relative Risk [ ]			
Diet 1	1.0013	1.033	2
Diet 2	1.00058	1.012	1.32
Diet 3	1.00055	1.012	1.36
Diet 4	1.0035	1.12	5.1

Probability of Causation [%]			
Diet 1	0.13	3.2	50
Diet 2	0.06	1.2	24
Diet 3	0.06	1.2	26
Diet 4	0.35	10.5	80

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.085	1.2	12
Commercial Milk (locally produced)	0.035	0.46	5
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.26	4.8	74
Beef (locally produced)	0.000049	0.0011	0.024
Leafy Vegetables (locally produced)	0.000069	0.00084	0.0085
Eggs (locally produced)	0.0034	0.052	0.61
Cottage Cheese (locally produced)	0.00017	0.004	0.09
Inhalation	0.0021	0.013	0.069
Mother's milk (mother on Diet 1)	0.0025	0.076	2.4
Prenatal exposure (mother on Diet 1)	0.024	0.25	3.1
Diet 1	0.098	1.3	13
Diet 2	0.06	0.57	5.6
Diet 3	0.027	0.24	2.4

Excess Lifetime Risk [ ]			
Diet 1	1.6E-05	4.1E-04	9.1E-03
Diet 2	9.5E-06	1.8E-04	3.0E-03
Diet 3	4.6E-06	7.5E-05	1.2E-03
Diet 4	5.1E-05	1.6E-03	4.1E-02

Relative Risk [ ]			
Diet 1	1.0065	1.097	2.9
Diet 2	1.0029	1.041	1.72
Diet 3	1.0011	1.018	1.38
Diet 4	1.017	1.36	9.1

Probability of Causation [%]			
Diet 1	0.65	8.8	66
Diet 2	0.29	3.9	42
Diet 3	0.11	1.8	27
Diet 4	1.70	26.2	89

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Bluff**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.093	1.4	15
Commercial Milk (locally produced)	0.036	0.46	4.3
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.36	4.7	79
Beef (locally produced)	0.000043	0.001	0.024
Leafy Vegetables (locally produced)	0.000051	0.00078	0.01
Eggs (locally produced)	0.0037	0.054	0.69
Cottage Cheese (locally produced)	0.0002	0.0042	0.076
Inhalation	0.0025	0.013	0.068
Mother's milk (mother on Diet 1)	0.0025	0.076	2.4
Prenatal exposure (mother on Diet 1)	0.024	0.25	3.1
Diet 1	0.11	1.5	16
Diet 2	0.057	0.58	4.8
Diet 3	0.025	0.25	2.2

Excess Lifetime Risk [ ]			
Diet 1	3.0E-06	9.5E-05	3.5E-03
Diet 2	1.4E-06	4.3E-05	1.1E-03
Diet 3	6.3E-07	1.8E-05	5.5E-04
Diet 4	9.8E-06	3.6E-04	1.2E-02

Relative Risk [ ]			
Diet 1	1.003	1.079	3.5
Diet 2	1.0014	1.029	1.97
Diet 3	1.00061	1.012	1.36
Diet 4	1.0084	1.28	11

Probability of Causation [%]			
Diet 1	0.30	7.3	71
Diet 2	0.14	2.8	49
Diet 3	0.06	1.2	27
Diet 4	0.83	21.8	91

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.02	0.3	3.4
Commercial Milk (locally produced)	0.0073	0.11	1.3
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.06	1.1	18
Beef (locally produced)	0.000011	0.00025	0.0056
Leafy Vegetables (locally produced)	0.000014	0.0002	0.0022
Eggs (locally produced)	0.00072	0.012	0.15
Cottage Cheese (locally produced)	0.000039	0.00093	0.021
Inhalation	0.00048	0.003	0.017
Mother's milk (mother on Diet 1)	0.00057	0.018	0.55
Prenatal exposure (mother on Diet 1)	0.006	0.057	0.72
Diet 1	0.022	0.32	3.5
Diet 2	0.012	0.14	1.4
Diet 3	0.02	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	3.6E-06	9.1E-05	2.1E-03
Diet 2	2.2E-06	4.2E-05	7.1E-04
Diet 3	4.1E-06	7.0E-05	1.2E-03
Diet 4	1.0E-05	3.7E-04	1.0E-02

Relative Risk [ ]			
Diet 1	1.0015	1.023	1.51
Diet 2	1.00066	1.01	1.21
Diet 3	1.00093	1.017	1.37
Diet 4	1.0036	1.087	3.2

Probability of Causation [%]			
Diet 1	0.15	2.2	33
Diet 2	0.07	1.0	17
Diet 3	0.09	1.7	27
Diet 4	0.36	7.9	67

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Oakdale**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.019	0.31	3.7
Commercial Milk (locally produced)	0.0081	0.11	1.1
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.076	1.1	20
Beef (locally produced)	0.000011	0.00024	0.0058
Leafy Vegetables (locally produced)	0.000011	0.00019	0.0024
Eggs (locally produced)	0.00085	0.012	0.15
Cottage Cheese (locally produced)	0.000044	0.00097	0.017
Inhalation	0.00055	0.0029	0.016
Mother's milk (mother on Diet 1)	0.00057	0.018	0.55
Prenatal exposure (mother on Diet 1)	0.006	0.057	0.72
Diet 1	0.022	0.32	3.9
Diet 2	0.012	0.14	1.2
Diet 3	0.019	0.23	2.2

Excess Lifetime Risk [ ]			
Diet 1	6.2E-07	2.3E-05	8.4E-04
Diet 2	3.1E-07	1.0E-05	2.8E-04
Diet 3	5.7E-07	1.7E-05	5.3E-04
Diet 4	2.1E-06	8.2E-05	3.5E-03

Relative Risk [ ]			
Diet 1	1.00063	1.019	1.55
Diet 2	1.00031	1.007	1.2
Diet 3	1.00053	1.012	1.36
Diet 4	1.0019	1.068	3.8

Probability of Causation [%]			
Diet 1	0.06	1.8	35
Diet 2	0.03	0.7	17
Diet 3	0.05	1.2	26
Diet 4	0.19	6.3	73

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.07	1	11
Commercial Milk (locally produced)	0.03	0.37	4.1
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.22	4	60
Beef (locally produced)	0.00004	0.00088	0.02
Leafy Vegetables (locally produced)	0.000057	0.00071	0.0074
Eggs (locally produced)	0.0027	0.043	0.52
Cottage Cheese (locally produced)	0.00014	0.0033	0.074
Inhalation	0.0018	0.011	0.056
Mother's milk (mother on Diet 1)	0.0021	0.062	2
Prenatal exposure (mother on Diet 1)	0.02	0.21	2.4
Diet 1	0.082	1.1	11
Diet 2	0.051	0.47	4.6
Diet 3	0.026	0.24	2.4

Excess Lifetime Risk [ ]			
Diet 1	1.4E-05	3.4E-04	7.7E-03
Diet 2	7.9E-06	1.5E-04	2.5E-03
Diet 3	4.3E-06	7.4E-05	1.2E-03
Diet 4	4.2E-05	1.3E-03	3.4E-02

Relative Risk [ ]			
Diet 1	1.0055	1.082	2.7
Diet 2	1.0024	1.034	1.63
Diet 3	1.001	1.018	1.38
Diet 4	1.014	1.29	7.6

Probability of Causation [%]			
Diet 1	0.55	7.5	62
Diet 2	0.24	3.3	39
Diet 3	0.11	1.8	27
Diet 4	1.39	22.7	87

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Claxton**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.077	1.1	12
Commercial Milk (locally produced)	0.03	0.39	3.6
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.3	3.9	67
Beef (locally produced)	0.000037	0.00083	0.02
Leafy Vegetables (locally produced)	0.000043	0.00065	0.0079
Eggs (locally produced)	0.0031	0.044	0.59
Cottage Cheese (locally produced)	0.00017	0.0035	0.062
Inhalation	0.0021	0.011	0.055
Mother's milk (mother on Diet 1)	0.0021	0.062	2
Prenatal exposure (mother on Diet 1)	0.02	0.21	2.4
Diet 1	0.087	1.2	13
Diet 2	0.049	0.48	4
Diet 3	0.024	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	2.7E-06	7.9E-05	2.8E-03
Diet 2	1.2E-06	3.6E-05	9.5E-04
Diet 3	6.2E-07	1.8E-05	5.5E-04
Diet 4	8.4E-06	3.0E-04	1.1E-02

Relative Risk [ ]			
Diet 1	1.0025	1.065	3
Diet 2	1.0012	1.024	1.76
Diet 3	1.00059	1.012	1.36
Diet 4	1.0068	1.23	9.9

Probability of Causation [%]			
Diet 1	0.25	6.1	67
Diet 2	0.12	2.4	43
Diet 3	0.06	1.2	27
Diet 4	0.68	18.7	90

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.037	0.52	5.3
Commercial Milk (locally produced)	0.014	0.18	2.1
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.12	2	29
Beef (locally produced)	0.000019	0.00042	0.0099
Leafy Vegetables (locally produced)	0.000027	0.00035	0.0034
Eggs (locally produced)	0.0013	0.021	0.25
Cottage Cheese (locally produced)	0.000064	0.0016	0.037
Inhalation	0.00084	0.0051	0.028
Mother's milk (mother on Diet 1)	0.001	0.03	0.92
Prenatal exposure (mother on Diet 1)	0.01	0.1	1.2
Diet 1	0.044	0.56	5.5
Diet 2	0.022	0.23	2.3
Diet 3	0.022	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	6.9E-06	1.6E-04	3.7E-03
Diet 2	4.2E-06	7.0E-05	1.3E-03
Diet 3	4.2E-06	7.1E-05	1.2E-03
Diet 4	1.9E-05	6.3E-04	1.8E-02

Relative Risk [ ]			
Diet 1	1.0028	1.039	1.82
Diet 2	1.0011	1.017	1.32
Diet 3	1.00097	1.017	1.37
Diet 4	1.0069	1.15	4.4

Probability of Causation [%]			
Diet 1	0.28	3.8	45
Diet 2	0.11	1.7	24
Diet 3	0.10	1.7	27
Diet 4	0.68	12.8	77

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Dutch Valley**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.035	0.52	5.8
Commercial Milk (locally produced)	0.014	0.18	1.8
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.14	2	32
Beef (locally produced)	0.000018	0.00039	0.01
Leafy Vegetables (locally produced)	0.00002	0.00033	0.004
Eggs (locally produced)	0.0016	0.021	0.27
Cottage Cheese (locally produced)	0.00008	0.0016	0.03
Inhalation	0.00095	0.0051	0.028
Mother's milk (mother on Diet 1)	0.001	0.03	0.92
Prenatal exposure (mother on Diet 1)	0.01	0.1	1.2
Diet 1	0.044	0.55	6.3
Diet 2	0.023	0.23	2
Diet 3	0.02	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	1.2E-06	4.0E-05	1.3E-03
Diet 2	6.1E-07	1.7E-05	4.9E-04
Diet 3	5.8E-07	1.7E-05	5.4E-04
Diet 4	3.8E-06	1.4E-04	6.0E-03

Relative Risk [ ]			
Diet 1	1.0012	1.031	1.96
Diet 2	1.00052	1.012	1.31
Diet 3	1.00054	1.012	1.36
Diet 4	1.0031	1.12	5.1

Probability of Causation [%]			
Diet 1	0.12	3.0	48
Diet 2	0.05	1.2	23
Diet 3	0.05	1.2	26
Diet 4	0.31	10.7	80

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.056	0.8	8.5
Commercial Milk (locally produced)	0.022	0.3	3
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.16	3.1	47
Beef (locally produced)	0.000032	0.00069	0.015
Leafy Vegetables (locally produced)	0.000044	0.00056	0.0056
Eggs (locally produced)	0.0022	0.034	0.39
Cottage Cheese (locally produced)	0.00011	0.0026	0.056
Inhalation	0.0014	0.0084	0.044
Mother's milk (mother on Diet 1)	0.0016	0.048	1.4
Prenatal exposure (mother on Diet 1)	0.016	0.16	1.9
Diet 1	0.064	0.88	8.9
Diet 2	0.038	0.37	3.6
Diet 3	0.024	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	1.0E-05	2.5E-04	5.6E-03
Diet 2	6.1E-06	1.1E-04	1.9E-03
Diet 3	4.3E-06	7.2E-05	1.2E-03
Diet 4	3.2E-05	1.0E-03	2.6E-02

Relative Risk [ ]			
Diet 1	1.0043	1.064	2.3
Diet 2	1.0019	1.026	1.49
Diet 3	1.001	1.018	1.38
Diet 4	1.011	1.24	6.5

Probability of Causation [%]			
Diet 1	0.43	6.0	56
Diet 2	0.19	2.5	32
Diet 3	0.10	1.7	27
Diet 4	1.05	18.9	84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Clinton**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.055	0.85	9.3
Commercial Milk (locally produced)	0.022	0.31	2.7
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.23	3.1	49
Beef (locally produced)	0.000028	0.00065	0.016
Leafy Vegetables (locally produced)	0.000033	0.00051	0.006
Eggs (locally produced)	0.0024	0.034	0.41
Cottage Cheese (locally produced)	0.00013	0.0026	0.047
Inhalation	0.0016	0.0085	0.043
Mother's milk (mother on Diet 1)	0.0016	0.048	1.4
Prenatal exposure (mother on Diet 1)	0.016	0.16	1.9
Diet 1	0.063	0.91	10
Diet 2	0.036	0.37	3
Diet 3	0.022	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	1.9E-06	6.3E-05	2.2E-03
Diet 2	8.8E-07	2.8E-05	7.1E-04
Diet 3	6.1E-07	1.7E-05	5.4E-04
Diet 4	5.9E-06	2.3E-04	8.4E-03

Relative Risk [ ]			
Diet 1	1.0018	1.05	2.5
Diet 2	1.00089	1.019	1.61
Diet 3	1.00056	1.012	1.36
Diet 4	1.0054	1.18	8.1

Probability of Causation [%]			
Diet 1	0.18	4.8	59
Diet 2	0.09	1.8	37
Diet 3	0.06	1.2	26
Diet 4	0.54	15.2	87

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.033	0.46	5.6
Commercial Milk (locally produced)	0.012	0.17	1.9
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.11	1.8	26
Beef (locally produced)	0.000018	0.00037	0.0079
Leafy Vegetables (locally produced)	0.000023	0.00032	0.003
Eggs (locally produced)	0.0012	0.02	0.26
Cottage Cheese (locally produced)	0.000058	0.0015	0.03
Inhalation	0.00092	0.0057	0.034
Mother's milk (mother on Diet 1)	0.00095	0.028	1
Prenatal exposure (mother on Diet 1)	0.0084	0.094	1.1
Diet 1	0.038	0.51	5.7
Diet 2	0.02	0.22	2.1
Diet 3	0.022	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	6.4E-06	1.4E-04	4.5E-03
Diet 2	3.5E-06	6.7E-05	1.1E-03
Diet 3	4.2E-06	7.1E-05	1.2E-03
Diet 4	1.8E-05	6.4E-04	1.5E-02

Relative Risk [ ]			
Diet 1	1.0028	1.035	1.74
Diet 2	1.00092	1.016	1.29
Diet 3	1.00097	1.018	1.37
Diet 4	1.0056	1.13	4.3

Probability of Causation [%]			
Diet 1	0.28	3.4	43
Diet 2	0.09	1.6	23
Diet 3	0.10	1.7	27
Diet 4	0.56	11.7	77

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Friendsville**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.033	0.47	5.6
Commercial Milk (locally produced)	0.012	0.17	1.6
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.13	1.8	30
Beef (locally produced)	0.000018	0.00035	0.0091
Leafy Vegetables (locally produced)	0.000019	0.00032	0.0033
Eggs (locally produced)	0.0015	0.02	0.26
Cottage Cheese (locally produced)	0.000073	0.0015	0.029
Inhalation	0.0011	0.0057	0.03
Mother's milk (mother on Diet 1)	0.00095	0.028	1
Prenatal exposure (mother on Diet 1)	0.0084	0.094	1.1
Diet 1	0.041	0.51	6.1
Diet 2	0.02	0.21	1.8
Diet 3	0.02	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	1.2E-06	3.6E-05	1.5E-03
Diet 2	5.8E-07	1.6E-05	4.6E-04
Diet 3	5.9E-07	1.7E-05	5.4E-04
Diet 4	3.4E-06	1.3E-04	5.6E-03

Relative Risk [ ]			
Diet 1	1.0011	1.027	2
Diet 2	1.0005	1.011	1.28
Diet 3	1.00054	1.012	1.36
Diet 4	1.0026	1.11	5.1

Probability of Causation [%]			
Diet 1	0.11	2.7	50
Diet 2	0.05	1.1	22
Diet 3	0.05	1.2	26
Diet 4	0.26	9.6	80

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.0092	0.13	1.5
Commercial Milk (locally produced)	0.0034	0.044	0.6
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.026	0.51	9.3
Beef (locally produced)	0.0000048	0.0001	0.0031
Leafy Vegetables (locally produced)	0.0000054	0.000083	0.00087
Eggs (locally produced)	0.0003	0.0052	0.08
Cottage Cheese (locally produced)	0.00002	0.00042	0.0085
Inhalation	0.0002	0.0013	0.0082
Mother's milk (mother on Diet 1)	0.00024	0.0071	0.29
Prenatal exposure (mother on Diet 1)	0.0023	0.025	0.38
Diet 1	0.011	0.14	1.5
Diet 2	0.0058	0.055	0.69
Diet 3	0.02	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	1.6E-06	4.3E-05	1.2E-03
Diet 2	8.7E-07	1.8E-05	3.9E-04
Diet 3	4.1E-06	7.0E-05	1.2E-03
Diet 4	4.7E-06	1.6E-04	4.3E-03

Relative Risk [ ]			
Diet 1	1.00064	1.0095	1.25
Diet 2	1.00028	1.0042	1.091
Diet 3	1.00084	1.017	1.37
Diet 4	1.0017	1.036	1.96

Probability of Causation [%]			
Diet 1	0.06	0.9	20
Diet 2	0.03	0.4	8
Diet 3	0.08	1.7	27
Diet 4	0.17	3.5	49

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Wartburg**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.0089	0.13	1.7
Commercial Milk (locally produced)	0.003	0.046	0.52
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.036	0.46	10
Beef (locally produced)	0.0000049	0.000093	0.0031
Leafy Vegetables (locally produced)	0.0000051	0.000086	0.0011
Eggs (locally produced)	0.0003	0.0052	0.075
Cottage Cheese (locally produced)	0.000021	0.00042	0.0074
Inhalation	0.00023	0.0013	0.0078
Mother's milk (mother on Diet 1)	0.00024	0.0071	0.29
Prenatal exposure (mother on Diet 1)	0.0023	0.025	0.38
Diet 1	0.011	0.14	1.8
Diet 2	0.0056	0.059	0.6
Diet 3	0.018	0.23	2.2

Excess Lifetime Risk [ ]			
Diet 1	2.6E-07	1.0E-05	3.7E-04
Diet 2	1.1E-07	3.9E-06	1.3E-04
Diet 3	5.5E-07	1.7E-05	5.3E-04
Diet 4	8.8E-07	3.6E-05	1.5E-03

Relative Risk [ ]			
Diet 1	1.00027	1.0072	1.27
Diet 2	1.00013	1.003	1.088
Diet 3	1.00052	1.012	1.36
Diet 4	1.00075	1.029	2

Probability of Causation [%]			
Diet 1	0.03	0.7	21
Diet 2	0.01	0.3	8
Diet 3	0.05	1.2	26
Diet 4	0.08	2.8	50

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.038	0.51	5.8
Commercial Milk (locally produced)	0.016	0.19	2.3
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.11	2.1	31
Beef (locally produced)	0.00002	0.00044	0.011
Leafy Vegetables (locally produced)	0.000028	0.00035	0.0037
Eggs (locally produced)	0.0014	0.022	0.28
Cottage Cheese (locally produced)	0.00007	0.0017	0.037
Inhalation	0.00095	0.0059	0.032
Mother's milk (mother on Diet 1)	0.0011	0.031	1
Prenatal exposure (mother on Diet 1)	0.01	0.1	1.3
Diet 1	0.045	0.56	6
Diet 2	0.026	0.24	2.5
Diet 3	0.023	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	7.1E-06	1.7E-04	4.3E-03
Diet 2	3.8E-06	7.4E-05	1.4E-03
Diet 3	4.2E-06	7.2E-05	1.2E-03
Diet 4	2.1E-05	6.9E-04	1.6E-02

Relative Risk [ ]			
Diet 1	1.0026	1.042	1.9
Diet 2	1.0012	1.017	1.35
Diet 3	1.00096	1.017	1.37
Diet 4	1.0061	1.15	4.5

Probability of Causation [%]			
Diet 1	0.26	4.0	46
Diet 2	0.12	1.7	25
Diet 3	0.10	1.7	27
Diet 4	0.61	12.7	76

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockwood**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.039	0.53	6.3
Commercial Milk (locally produced)	0.014	0.19	1.9
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.15	2	32
Beef (locally produced)	0.00002	0.00042	0.011
Leafy Vegetables (locally produced)	0.000021	0.00034	0.0044
Eggs (locally produced)	0.0015	0.022	0.28
Cottage Cheese (locally produced)	0.000091	0.0017	0.031
Inhalation	0.0011	0.0059	0.031
Mother's milk (mother on Diet 1)	0.0011	0.031	1
Prenatal exposure (mother on Diet 1)	0.01	0.1	1.3
Diet 1	0.043	0.57	6.7
Diet 2	0.024	0.24	2.2
Diet 3	0.02	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	1.4E-06	4.1E-05	1.4E-03
Diet 2	6.9E-07	1.8E-05	5.2E-04
Diet 3	5.9E-07	1.7E-05	5.4E-04
Diet 4	4.2E-06	1.5E-04	5.8E-03

Relative Risk [ ]			
Diet 1	1.0012	1.032	1.99
Diet 2	1.00057	1.013	1.39
Diet 3	1.00054	1.012	1.36
Diet 4	1.0032	1.12	5.3

Probability of Causation [%]			
Diet 1	0.12	3.1	49
Diet 2	0.06	1.3	28
Diet 3	0.05	1.2	26
Diet 4	0.32	10.3	80

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.038	0.49	5
Commercial Milk (locally produced)	0.013	0.17	2.2
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.11	1.9	29
Beef (locally produced)	0.000018	0.00041	0.0096
Leafy Vegetables (locally produced)	0.000025	0.00033	0.0031
Eggs (locally produced)	0.0013	0.021	0.26
Cottage Cheese (locally produced)	0.000066	0.0016	0.034
Inhalation	0.00096	0.0058	0.033
Mother's milk (mother on Diet 1)	0.001	0.029	0.9
Prenatal exposure (mother on Diet 1)	0.0097	0.098	1.2
Diet 1	0.044	0.52	5.2
Diet 2	0.022	0.22	2.4
Diet 3	0.022	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	6.6E-06	1.6E-04	3.9E-03
Diet 2	3.6E-06	6.8E-05	1.3E-03
Diet 3	4.2E-06	7.2E-05	1.2E-03
Diet 4	2.0E-05	6.2E-04	1.6E-02

Relative Risk [ ]			
Diet 1	1.0028	1.038	1.8
Diet 2	1.0012	1.016	1.32
Diet 3	1.00098	1.017	1.37
Diet 4	1.0063	1.14	4.3

Probability of Causation [%]			
Diet 1	0.28	3.6	44
Diet 2	0.12	1.6	24
Diet 3	0.10	1.7	27
Diet 4	0.63	12.4	76

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Louisville**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.035	0.5	5.8
Commercial Milk (locally produced)	0.013	0.18	1.8
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.13	1.9	32
Beef (locally produced)	0.000018	0.00038	0.01
Leafy Vegetables (locally produced)	0.00002	0.00032	0.0039
Eggs (locally produced)	0.0014	0.02	0.26
Cottage Cheese (locally produced)	0.00008	0.0016	0.028
Inhalation	0.0011	0.0059	0.033
Mother's milk (mother on Diet 1)	0.001	0.029	0.9
Prenatal exposure (mother on Diet 1)	0.0097	0.098	1.2
Diet 1	0.041	0.53	6.2
Diet 2	0.023	0.22	2
Diet 3	0.021	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	1.2E-06	4.0E-05	1.3E-03
Diet 2	5.5E-07	1.6E-05	4.7E-04
Diet 3	5.9E-07	1.7E-05	5.4E-04
Diet 4	3.7E-06	1.4E-04	5.7E-03

Relative Risk [ ]			
Diet 1	1.0011	1.029	1.94
Diet 2	1.00051	1.012	1.31
Diet 3	1.00055	1.012	1.36
Diet 4	1.0028	1.11	4.8

Probability of Causation [%]			
Diet 1	0.11	2.8	48
Diet 2	0.05	1.1	23
Diet 3	0.06	1.2	26
Diet 4	0.28	9.8	79

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.04	0.54	6
Commercial Milk (locally produced)	0.015	0.2	2.5
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.13	2.2	31
Beef (locally produced)	0.000021	0.00046	0.01
Leafy Vegetables (locally produced)	0.000028	0.00037	0.0036
Eggs (locally produced)	0.0015	0.023	0.33
Cottage Cheese (locally produced)	0.000067	0.0018	0.04
Inhalation	0.0011	0.0068	0.039
Mother's milk (mother on Diet 1)	0.0012	0.032	1.1
Prenatal exposure (mother on Diet 1)	0.01	0.11	1.4
Diet 1	0.047	0.59	6.3
Diet 2	0.026	0.25	2.9
Diet 3	0.022	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	7.4E-06	1.8E-04	4.1E-03
Diet 2	4.0E-06	7.8E-05	1.3E-03
Diet 3	4.2E-06	7.2E-05	1.2E-03
Diet 4	2.3E-05	7.3E-04	1.7E-02

Relative Risk [ ]			
Diet 1	1.003	1.043	1.84
Diet 2	1.0013	1.018	1.37
Diet 3	1.00099	1.017	1.37
Diet 4	1.0071	1.16	4.7

Probability of Causation [%]			
Diet 1	0.30	4.1	46
Diet 2	0.13	1.8	27
Diet 3	0.10	1.7	27
Diet 4	0.71	13.6	79

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Barnardville**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.039	0.57	6.8
Commercial Milk (locally produced)	0.015	0.21	1.9
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.16	2.2	33
Beef (locally produced)	0.000021	0.00044	0.01
Leafy Vegetables (locally produced)	0.000023	0.00036	0.0043
Eggs (locally produced)	0.0015	0.024	0.31
Cottage Cheese (locally produced)	0.000084	0.0018	0.031
Inhalation	0.0013	0.007	0.037
Mother's milk (mother on Diet 1)	0.0012	0.032	1.1
Prenatal exposure (mother on Diet 1)	0.01	0.11	1.4
Diet 1	0.046	0.62	7.3
Diet 2	0.024	0.26	2.4
Diet 3	0.021	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	1.4E-06	4.4E-05	1.5E-03
Diet 2	6.1E-07	1.9E-05	5.2E-04
Diet 3	5.9E-07	1.7E-05	5.4E-04
Diet 4	4.3E-06	1.6E-04	5.7E-03

Relative Risk [ ]			
Diet 1	1.0013	1.033	2.2
Diet 2	1.00061	1.013	1.38
Diet 3	1.00054	1.012	1.36
Diet 4	1.0034	1.12	5.8

Probability of Causation [%]			
Diet 1	0.13	3.2	55
Diet 2	0.06	1.3	27
Diet 3	0.05	1.2	26
Diet 4	0.34	10.8	82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.021	0.3	3.7
Commercial Milk (locally produced)	0.0089	0.11	1.2
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.069	1.3	18
Beef (locally produced)	0.0000097	0.00025	0.0062
Leafy Vegetables (locally produced)	0.000015	0.0002	0.0023
Eggs (locally produced)	0.00086	0.013	0.18
Cottage Cheese (locally produced)	0.000041	0.001	0.022
Inhalation	0.00068	0.0039	0.025
Mother's milk (mother on Diet 1)	0.00062	0.018	0.56
Prenatal exposure (mother on Diet 1)	0.0064	0.063	0.75
Diet 1	0.024	0.33	4
Diet 2	0.017	0.14	1.4
Diet 3	0.021	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	3.7E-06	9.7E-05	2.3E-03
Diet 2	2.4E-06	4.4E-05	7.7E-04
Diet 3	4.1E-06	7.1E-05	1.2E-03
Diet 4	1.2E-05	4.2E-04	1.1E-02

Relative Risk [ ]			
Diet 1	1.0018	1.023	1.55
Diet 2	1.00074	1.0099	1.2
Diet 3	1.00094	1.017	1.37
Diet 4	1.0036	1.087	3.2

Probability of Causation [%]			
Diet 1	0.18	2.3	36
Diet 2	0.07	1.0	16
Diet 3	0.09	1.7	27
Diet 4	0.36	8.0	68

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Greenback**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.02	0.31	4.1
Commercial Milk (locally produced)	0.0077	0.11	1
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.087	1.1	20
Beef (locally produced)	0.000011	0.00024	0.0066
Leafy Vegetables (locally produced)	0.000012	0.00019	0.0026
Eggs (locally produced)	0.00097	0.013	0.16
Cottage Cheese (locally produced)	0.000055	0.00098	0.02
Inhalation	0.00074	0.0039	0.022
Mother's milk (mother on Diet 1)	0.00062	0.018	0.56
Prenatal exposure (mother on Diet 1)	0.0064	0.063	0.75
Diet 1	0.027	0.34	4.3
Diet 2	0.014	0.14	1.1
Diet 3	0.019	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	7.4E-07	2.3E-05	8.1E-04
Diet 2	3.7E-07	1.0E-05	2.9E-04
Diet 3	5.7E-07	1.7E-05	5.3E-04
Diet 4	2.2E-06	9.1E-05	3.8E-03

Relative Risk [ ]			
Diet 1	1.00081	1.02	1.53
Diet 2	1.00036	1.0079	1.21
Diet 3	1.00053	1.012	1.36
Diet 4	1.0019	1.072	3.5

Probability of Causation [%]			
Diet 1	0.08	1.9	34
Diet 2	0.04	0.8	17
Diet 3	0.05	1.2	26
Diet 4	0.19	6.7	71

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.032	0.47	5.2
Commercial Milk (locally produced)	0.014	0.17	1.8
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.1	1.9	26
Beef (locally produced)	0.000017	0.00039	0.0092
Leafy Vegetables (locally produced)	0.000025	0.00033	0.0034
Eggs (locally produced)	0.0012	0.02	0.26
Cottage Cheese (locally produced)	0.000067	0.0015	0.032
Inhalation	0.001	0.006	0.033
Mother's milk (mother on Diet 1)	0.001	0.028	0.83
Prenatal exposure (mother on Diet 1)	0.0099	0.096	1.1
Diet 1	0.038	0.51	5.6
Diet 2	0.024	0.22	2.1
Diet 3	0.022	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	6.5E-06	1.5E-04	3.6E-03
Diet 2	3.5E-06	6.8E-05	1.2E-03
Diet 3	4.2E-06	7.2E-05	1.2E-03
Diet 4	1.8E-05	6.4E-04	1.6E-02

Relative Risk [ ]			
Diet 1	1.0026	1.037	1.81
Diet 2	1.0012	1.016	1.31
Diet 3	1.00099	1.017	1.37
Diet 4	1.0057	1.14	4.3

Probability of Causation [%]			
Diet 1	0.26	3.6	45
Diet 2	0.12	1.6	24
Diet 3	0.10	1.7	27
Diet 4	0.57	12.1	76

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Rockford**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.032	0.49	5.4
Commercial Milk (locally produced)	0.012	0.18	1.5
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.13	1.9	29
Beef (locally produced)	0.000017	0.00038	0.0093
Leafy Vegetables (locally produced)	0.00002	0.00031	0.0036
Eggs (locally produced)	0.0015	0.02	0.24
Cottage Cheese (locally produced)	0.000081	0.0016	0.027
Inhalation	0.0011	0.0058	0.031
Mother's milk (mother on Diet 1)	0.001	0.028	0.83
Prenatal exposure (mother on Diet 1)	0.0099	0.096	1.1
Diet 1	0.038	0.53	5.8
Diet 2	0.023	0.23	1.7
Diet 3	0.02	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	1.2E-06	3.6E-05	1.2E-03
Diet 2	5.5E-07	1.7E-05	4.5E-04
Diet 3	5.9E-07	1.7E-05	5.4E-04
Diet 4	3.6E-06	1.4E-04	5.6E-03

Relative Risk [ ]			
Diet 1	1.0012	1.03	1.82
Diet 2	1.00054	1.012	1.32
Diet 3	1.00054	1.012	1.36
Diet 4	1.003	1.11	5.2

Probability of Causation [%]			
Diet 1	0.12	2.9	45
Diet 2	0.05	1.1	24
Diet 3	0.05	1.2	26
Diet 4	0.30	9.9	80

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.022	0.28	2.8
Commercial Milk (locally produced)	0.0092	0.11	1.2
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.068	1.2	17
Beef (locally produced)	0.000011	0.00025	0.0062
Leafy Vegetables (locally produced)	0.000016	0.0002	0.0019
Eggs (locally produced)	0.00077	0.012	0.15
Cottage Cheese (locally produced)	0.000045	0.00094	0.02
Inhalation	0.00051	0.0032	0.017
Mother's milk (mother on Diet 1)	0.00059	0.018	0.57
Prenatal exposure (mother on Diet 1)	0.006	0.057	0.7
Diet 1	0.026	0.3	3
Diet 2	0.015	0.13	1.4
Diet 3	0.021	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	4.3E-06	9.5E-05	2.4E-03
Diet 2	2.2E-06	3.9E-05	7.9E-04
Diet 3	4.1E-06	7.0E-05	1.2E-03
Diet 4	1.2E-05	3.7E-04	9.9E-03

Relative Risk [ ]			
Diet 1	1.0017	1.023	1.48
Diet 2	1.00073	1.0097	1.18
Diet 3	1.00095	1.017	1.37
Diet 4	1.0041	1.083	2.9

Probability of Causation [%]			
Diet 1	0.17	2.2	32
Diet 2	0.07	1.0	15
Diet 3	0.10	1.7	27
Diet 4	0.41	7.6	65

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Lake City**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.023	0.31	3.3
Commercial Milk (locally produced)	0.0087	0.11	1
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.086	1.1	19
Beef (locally produced)	0.000011	0.00023	0.006
Leafy Vegetables (locally produced)	0.000012	0.00019	0.0024
Eggs (locally produced)	0.00087	0.012	0.15
Cottage Cheese (locally produced)	0.00005	0.00095	0.016
Inhalation	0.00061	0.0032	0.017
Mother's milk (mother on Diet 1)	0.00059	0.018	0.57
Prenatal exposure (mother on Diet 1)	0.006	0.057	0.7
Diet 1	0.026	0.33	3.6
Diet 2	0.015	0.13	1.1
Diet 3	0.019	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	6.8E-07	2.3E-05	8.1E-04
Diet 2	3.0E-07	9.5E-06	2.8E-04
Diet 3	5.7E-07	1.7E-05	5.3E-04
Diet 4	2.3E-06	8.4E-05	3.5E-03

Relative Risk [ ]			
Diet 1	1.00077	1.018	1.56
Diet 2	1.00033	1.0068	1.19
Diet 3	1.00053	1.012	1.36
Diet 4	1.0018	1.067	3.3

Probability of Causation [%]			
Diet 1	0.08	1.7	35
Diet 2	0.03	0.7	16
Diet 3	0.05	1.2	26
Diet 4	0.18	6.2	69

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.026	0.37	3.8
Commercial Milk (locally produced)	0.0094	0.13	1.5
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.082	1.4	21
Beef (locally produced)	0.000014	0.0003	0.0065
Leafy Vegetables (locally produced)	0.000019	0.00025	0.0023
Eggs (locally produced)	0.00099	0.015	0.19
Cottage Cheese (locally produced)	0.000048	0.0012	0.024
Inhalation	0.00073	0.0047	0.026
Mother's milk (mother on Diet 1)	0.00075	0.022	0.66
Prenatal exposure (mother on Diet 1)	0.0069	0.071	0.84
Diet 1	0.032	0.39	4
Diet 2	0.015	0.17	1.6
Diet 3	0.022	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	4.8E-06	1.1E-04	2.9E-03
Diet 2	2.6E-06	5.1E-05	8.4E-04
Diet 3	4.2E-06	7.1E-05	1.2E-03
Diet 4	1.4E-05	4.4E-04	1.1E-02

Relative Risk [ ]			
Diet 1	1.0022	1.027	1.58
Diet 2	1.00079	1.012	1.22
Diet 3	1.00096	1.017	1.37
Diet 4	1.0048	1.11	3.5

Probability of Causation [%]			
Diet 1	0.22	2.6	37
Diet 2	0.08	1.2	18
Diet 3	0.10	1.7	27
Diet 4	0.48	9.7	71

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Sweetwater**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.027	0.36	4.3
Commercial Milk (locally produced)	0.01	0.13	1.3
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.091	1.4	22
Beef (locally produced)	0.000013	0.00028	0.0072
Leafy Vegetables (locally produced)	0.000015	0.00023	0.0027
Eggs (locally produced)	0.0011	0.015	0.2
Cottage Cheese (locally produced)	0.000062	0.0012	0.023
Inhalation	0.00081	0.0047	0.026
Mother's milk (mother on Diet 1)	0.00075	0.022	0.66
Prenatal exposure (mother on Diet 1)	0.0069	0.071	0.84
Diet 1	0.032	0.39	4.5
Diet 2	0.017	0.16	1.4
Diet 3	0.02	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	8.7E-07	2.8E-05	9.2E-04
Diet 2	4.9E-07	1.2E-05	3.7E-04
Diet 3	5.8E-07	1.7E-05	5.4E-04
Diet 4	2.8E-06	1.0E-04	4.2E-03

Relative Risk [ ]			
Diet 1	1.00076	1.021	1.66
Diet 2	1.00034	1.0084	1.2
Diet 3	1.00054	1.012	1.36
Diet 4	1.002	1.081	3.8

Probability of Causation [%]			
Diet 1	0.08	2.1	40
Diet 2	0.03	0.8	17
Diet 3	0.05	1.2	26
Diet 4	0.20	7.5	73

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.043	0.61	6.7
Commercial Milk (locally produced)	0.016	0.22	2.3
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.12	2.4	35
Beef (locally produced)	0.000024	0.00051	0.011
Leafy Vegetables (locally produced)	0.000032	0.00041	0.0042
Eggs (locally produced)	0.0016	0.026	0.32
Cottage Cheese (locally produced)	0.000076	0.0019	0.042
Inhalation	0.0013	0.0074	0.04
Mother's milk (mother on Diet 1)	0.0013	0.035	1.1
Prenatal exposure (mother on Diet 1)	0.012	0.12	1.5
Diet 1	0.05	0.66	7.1
Diet 2	0.028	0.28	2.7
Diet 3	0.023	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	7.9E-06	1.9E-04	4.3E-03
Diet 2	4.4E-06	8.7E-05	1.5E-03
Diet 3	4.2E-06	7.2E-05	1.2E-03
Diet 4	2.2E-05	7.9E-04	2.0E-02

Relative Risk [ ]			
Diet 1	1.0033	1.047	1.97
Diet 2	1.0015	1.02	1.35
Diet 3	1.001	1.018	1.38
Diet 4	1.0074	1.17	4.8

Probability of Causation [%]			
Diet 1	0.32	4.5	49
Diet 2	0.15	2.0	26
Diet 3	0.10	1.7	27
Diet 4	0.73	14.8	79

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Knoxville**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.04	0.63	6.7
Commercial Milk (locally produced)	0.016	0.23	2
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.16	2.3	35
Beef (locally produced)	0.000023	0.00049	0.012
Leafy Vegetables (locally produced)	0.000025	0.00038	0.0047
Eggs (locally produced)	0.0018	0.025	0.3
Cottage Cheese (locally produced)	0.000096	0.002	0.036
Inhalation	0.0014	0.0073	0.039
Mother's milk (mother on Diet 1)	0.0013	0.035	1.1
Prenatal exposure (mother on Diet 1)	0.012	0.12	1.5
Diet 1	0.045	0.68	7.2
Diet 2	0.028	0.28	2.2
Diet 3	0.022	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	1.5E-06	4.6E-05	1.6E-03
Diet 2	6.8E-07	2.1E-05	5.3E-04
Diet 3	6.0E-07	1.7E-05	5.4E-04
Diet 4	4.7E-06	1.8E-04	6.8E-03

Relative Risk [ ]			
Diet 1	1.0014	1.038	2.1
Diet 2	1.00069	1.014	1.41
Diet 3	1.00055	1.012	1.36
Diet 4	1.0038	1.14	6.1

Probability of Causation [%]			
Diet 1	0.14	3.6	53
Diet 2	0.07	1.4	29
Diet 3	0.06	1.2	26
Diet 4	0.38	12.2	84

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.02	0.28	3.4
Commercial Milk (locally produced)	0.0086	0.11	1.3
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.07	1.1	16
Beef (locally produced)	0.000011	0.00024	0.0052
Leafy Vegetables (locally produced)	0.000015	0.0002	0.002
Eggs (locally produced)	0.00083	0.012	0.18
Cottage Cheese (locally produced)	0.000038	0.00094	0.022
Inhalation	0.00062	0.004	0.023
Mother's milk (mother on Diet 1)	0.00057	0.018	0.59
Prenatal exposure (mother on Diet 1)	0.0055	0.061	0.58
Diet 1	0.025	0.31	3.6
Diet 2	0.014	0.13	1.6
Diet 3	0.021	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	3.8E-06	9.5E-05	2.0E-03
Diet 2	2.1E-06	4.2E-05	6.9E-04
Diet 3	4.1E-06	7.1E-05	1.2E-03
Diet 4	1.1E-05	4.0E-04	9.7E-03

Relative Risk [ ]			
Diet 1	1.0015	1.023	1.47
Diet 2	1.00066	1.0091	1.18
Diet 3	1.00094	1.017	1.37
Diet 4	1.0038	1.084	2.9

Probability of Causation [%]			
Diet 1	0.15	2.2	32
Diet 2	0.07	0.9	15
Diet 3	0.09	1.7	27
Diet 4	0.38	7.8	65

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Maryville**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.02	0.31	3.8
Commercial Milk (locally produced)	0.0083	0.11	1.2
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.089	1.2	18
Beef (locally produced)	0.000012	0.00024	0.0058
Leafy Vegetables (locally produced)	0.000013	0.0002	0.0023
Eggs (locally produced)	0.00091	0.012	0.16
Cottage Cheese (locally produced)	0.000045	0.00094	0.017
Inhalation	0.00071	0.004	0.022
Mother's milk (mother on Diet 1)	0.00057	0.018	0.59
Prenatal exposure (mother on Diet 1)	0.0055	0.061	0.58
Diet 1	0.024	0.34	3.9
Diet 2	0.013	0.14	1.3
Diet 3	0.019	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	6.3E-07	2.3E-05	8.9E-04
Diet 2	3.3E-07	1.0E-05	2.8E-04
Diet 3	5.7E-07	1.7E-05	5.3E-04
Diet 4	2.1E-06	8.9E-05	3.0E-03

Relative Risk [ ]			
Diet 1	1.00075	1.018	1.65
Diet 2	1.00034	1.0075	1.2
Diet 3	1.00053	1.012	1.36
Diet 4	1.002	1.065	3.7

Probability of Causation [%]			
Diet 1	0.08	1.8	39
Diet 2	0.03	0.7	17
Diet 3	0.05	1.2	26
Diet 4	0.20	6.1	73

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**  
**Receptor: Female born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.037	0.54	6
Commercial Milk (locally produced)	0.016	0.19	2
Commercial Milk (regionally mixed)	0.018	0.22	2.4
Goat Milk (locally produced)	0.12	2.2	31
Beef (locally produced)	0.00002	0.00046	0.011
Leafy Vegetables (locally produced)	0.000029	0.00037	0.004
Eggs (locally produced)	0.0014	0.023	0.29
Cottage Cheese (locally produced)	0.000074	0.0018	0.038
Inhalation	0.0011	0.0065	0.033
Mother's milk (mother on Diet 1)	0.0012	0.033	1
Prenatal exposure (mother on Diet 1)	0.011	0.11	1.2
Diet 1	0.043	0.59	6.4
Diet 2	0.028	0.25	2.4
Diet 3	0.023	0.23	2.4

Excess Lifetime Risk [ ]			
Diet 1	7.6E-06	1.7E-04	4.1E-03
Diet 2	4.2E-06	7.8E-05	1.3E-03
Diet 3	4.2E-06	7.2E-05	1.2E-03
Diet 4	2.2E-05	7.4E-04	1.9E-02

Relative Risk [ ]			
Diet 1	1.0031	1.043	1.92
Diet 2	1.0013	1.018	1.35
Diet 3	1.001	1.018	1.37
Diet 4	1.0069	1.15	4.6

Probability of Causation [%]			
Diet 1	0.31	4.1	48
Diet 2	0.13	1.8	26
Diet 3	0.10	1.7	27
Diet 4	0.69	13.4	78

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**Location: Cedar Grove**

**Receptor: Male born in 1956**

Exposure Pathway	Thyroid Dose [cGy]		
	95% Subjective Confidence Interval		
	lower limit	central estimate	upper limit
Backyard Cow Milk	0.039	0.56	6
Commercial Milk (locally produced)	0.015	0.21	1.8
Commercial Milk (regionally mixed)	0.017	0.23	2.2
Goat Milk (locally produced)	0.15	2.1	34
Beef (locally produced)	0.000021	0.00044	0.011
Leafy Vegetables (locally produced)	0.000023	0.00035	0.004
Eggs (locally produced)	0.0017	0.023	0.3
Cottage Cheese (locally produced)	0.000093	0.0018	0.031
Inhalation	0.0012	0.0064	0.034
Mother's milk (mother on Diet 1)	0.0012	0.033	1
Prenatal exposure (mother on Diet 1)	0.011	0.11	1.2
Diet 1	0.044	0.61	6.4
Diet 2	0.027	0.26	2.1
Diet 3	0.02	0.24	2.2

Excess Lifetime Risk [ ]			
Diet 1	1.5E-06	4.2E-05	1.4E-03
Diet 2	6.2E-07	1.9E-05	5.0E-04
Diet 3	5.9E-07	1.7E-05	5.4E-04
Diet 4	4.3E-06	1.6E-04	6.7E-03

Relative Risk [ ]			
Diet 1	1.0014	1.034	1.98
Diet 2	1.00064	1.013	1.36
Diet 3	1.00054	1.012	1.36
Diet 4	1.0035	1.13	5.6

Probability of Causation [%]			
Diet 1	0.14	3.3	49
Diet 2	0.06	1.3	26
Diet 3	0.05	1.2	26
Diet 4	0.35	11.1	82

Diet 1 - Backyard cow milk + all other locally produced non-milk exposure pathways

Diet 2 - Locally produced commercial milk + all other locally produced non-milk exposure pathways

Diet 3 - Regionally mixed commercial milk + inhalation (other regionally mixed food items are minor contributors to the total)

Diet 4 - Goat milk (all other exposure pathways are of negligible importance compared to goat milk)

**APPENDIX 12A**

**MILK PRODUCTION DATA**

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### APPENDIX 12A: MILK PRODUCTION DATA

Milk production for the state of Tennessee has been recorded since 1929 (NASS, 1998b). Available milk production records represent the entire state and not specific counties or other regions of interest (metropolitan areas, geographic regions, etc.). Appendix 12-A presents the data used to determine the volume of milk produced within a 38-km radius of the X-10 facility. Appendix 12-A also provides the areas of the six counties of interest: Anderson, Blount, Knox, Loudon, Morgan, and Roane. The areas of these counties were used to determine the fraction of each county that was within 38 km of X-10. Table 12-A.1 provides the volume of backyard cow's milk produced in the state of Tennessee from 1944 to 1956. The volume of commercial milk produced in the state of Tennessee from 1944 to 1956 is listed in Table 12-A.2. The number of cows in Anderson, Blount, Knox, Loudon, Morgan, and Roane counties during the years 1975 to 1991 are provided in Table 12-A.3. Tables 12-A.4 and 12-A.5 list the estimated volume of backyard cow's milk and commercial milk respectively, available for use in the six counties of interest from 1944 to 1956. The estimated values are based on the average number of cows in each county during the period of 1975 to 1991. The yearly milk production and utilization patterns (fed to calves, used to produce cream or butter, marketed, etc.) are provided in Table 12-A.6. This information was used to determine the range for the fraction of fluid milk available for human consumption ( $f_1$ ) between 1944 and 1956. Table 12-A.7 lists the areas of the counties affected by the atmospheric releases of  $^{131}\text{I}$ . The areas were used to determine the fraction of the counties within a 38-km radius of X-10 ( $f_3$ ).

Table 12-A.1 The volume of backyard cow's milk produced in the state of Tennessee from 1944 to 1956 (NASS, 1998b).

Year	Fluid Milk/Cream Consumed on Farm (L)	Milk/Cream Sold by Farmers to Consumers (L)	Total Amount of Backyard Cow's Milk (L)
1944	200,584,599	37,389,673	237,974,272
1945	184,309,094	37,389,673	221,698,767
1946	190,467,393	37,389,673	227,857,066
1947	195,745,935	36,509,916	232,255,851
1948	189,587,636	35,630,159	225,217,795
1949	183,429,337	35,190,280	218,619,617
1950	189,587,636	35,190,280	224,777,916
1951	190,907,271	33,430,766	224,338,038
1952	186,948,365	30,791,495	217,739,860
1953	181,229,944	27,272,467	208,502,412
1954	176,831,159	26,392,710	203,223,870
1955	169,793,103	23,313,561	193,106,664
1956	167,153,832	19,794,533	186,948,365

Table 12-A.2 The volume of commercial milk produced in the state of Tennessee from 1944 to 1956 (NASS, 1998b).

Year	Cream Sold to Dealers (L)	Milk Sold to Dealers (L)	Total Commercial Milk Produced in TN (L)
1944	98,972,664	437,679,113	536,651,777
1945	87,975,701	455,274,253	543,249,954
1946	67,741,290	468,470,608	536,211,898
1947	61,582,991	483,866,356	545,449,347
1948	61,582,991	489,144,898	550,727,889
1949	68,181,168	538,851,169	607,032,338
1950	61,582,991	560,845,095	622,428,085
1951	56,304,449	565,243,880	621,548,328
1952	52,785,421	589,437,197	642,222,618
1953	48,386,636	686,210,469	734,597,104
1954	23,313,561	703,805,609	727,119,170
1955	21,993,925	718,761,478	740,755,403
1956	19,794,533	779,904,590	799,699,123

Table 12-A.3 The number of dairy cows in Anderson, Blount, Knox, Loudon, Morgan, and Roane counties from 1975 to 1991 (NASS, 1998a).

Year	County					
	Anderson	Blount	Knox	Loudon	Morgan	Roane
1975	800	2,900	1,400	3,500	550	1,000
1976	700	2,800	1,300	3,500	500	1,200
1977	600	2,900	1,300	4,000	550	1,300
1978	550	2,600	1,300	4,000	550	1,200
1979	600	2,700	1,300	3,750	650	1,250
1980	600	2,850	1,250	3,800	600	1,350
1981	700	3,200	1,200	4,300	500	1,450
1982	700	3,300	1,400	4,800	500	1,400
1983	700	3,100	1,500	4,700	650	900
1984	700	3,000	1,600	4,700	600	700
1985	700	2,900	1,500	4,400	600	750
1986	700	2,800	1,400	4,300	600	700
1987	700	2,700	1,300	4,100	500	700
1988	700	2,800	1,400	3,900	500	700
1989	500	2,400	1,500	3,500	500	500
1990	500	2,400	1,500	3,300	400	400
1991	500	2,400	1,500	3,300	400	400

*<sup>131</sup>I Releases from X-10 Radioactive Lanthanum Processing -  
Milk Production Data*

Table 12-A.4 The volume of backyard cow's milk (L) produced from 1944 to 1956 in Anderson, Blount, Knox, Loudon, Morgan, and Roane counties based on the average number of cows in each county.

Year	County					
	Anderson	Blount	Knox	Loudon	Morgan	Roane
1944	313,356	676,791	1,941,661	455,010	261,737	1,366,460
1945	291,925	630,504	1,808,867	423,891	243,836	1,273,005
1946	300,034	648,018	1,859,114	435,666	250,609	1,308,367
1947	305,826	660,528	1,895,004	444,076	255,447	1,333,625
1948	296,559	640,512	1,837,580	430,619	247,706	1,293,212
1949	287,870	621,747	1,783,744	418,003	240,449	1,255,325
1950	295,979	639,261	1,833,991	429,778	247,223	1,290,686
1951	295,400	638,010	1,830,402	428,937	246,739	1,288,160
1952	286,712	619,245	1,776,566	416,321	239,482	1,250,273
1953	274,548	592,974	1,701,197	398,659	229,322	1,197,231
1954	267,598	577,962	1,658,128	388,567	223,516	1,166,922
1955	254,276	549,189	1,575,581	369,222	212,389	1,108,828
1956	246,167	531,675	1,525,335	357,448	205,616	1,073,467

Table 12-A.5 The volume of commercial milk (L) produced from 1944 to 1956 in Anderson, Blount, Knox, Loudon, Morgan, and Roane counties based on the average number of cows in each county.

Year	County					
	Anderson	Blount	Knox	Loudon	Morgan	Roane
1944	706,643	1,526,221	4,378,608	1,026,085	590,238	3,081,481
1945	715,332	1,544,986	4,432,443	1,038,701	597,495	3,119,368
1946	706,064	1,524,970	4,375,019	1,025,244	589,754	3,078,956
1947	718,228	1,551,241	4,450,388	1,042,906	599,914	3,131,998
1948	725,178	1,566,253	4,493,456	1,052,999	605,719	3,162,307
1949	799,318	1,726,381	4,952,851	1,160,653	667,646	3,485,610
1950	819,590	1,770,166	5,078,467	1,190,090	684,579	3,574,013
1951	818,432	1,767,664	5,071,289	1,188,408	683,611	3,568,962
1952	845,655	1,826,461	5,239,973	1,227,938	706,350	3,687,674
1953	967,291	2,089,171	5,993,668	1,404,559	807,948	4,218,093
1954	957,444	2,067,904	5,932,654	1,390,261	799,724	4,175,155
1955	975,400	2,106,685	6,043,914	1,416,334	814,722	4,253,455
1956	1,053,014	2,274,319	6,524,843	1,529,035	879,551	4,591,912

Table 12-A.6 The yearly production and utilization of milk (millions of pounds) in the state of Tennessee during 1950-1969 and 1975-1996 (NASS, 1998b).

Year	Milk Produced	Milk Fed to Calves	Milk Used for Cream and Butter	Milk Marketed	Fraction of Milk Available
1950	2,329	40	794	1,495	0.64
1951	2,311	44	778	1,489	0.64
1952	2,294	42	727	1,525	0.66
1953	2,421	42	674	1,705	0.70
1954	2,416	43	660	1,713	0.71
1955	2,372	40	599	1,733	0.73
1956	2,445	39	549	1,857	0.76
1957	2,422	36	489	1,897	0.78
1958	2,279	34	431	1,814	0.80
1959	2,200	33	365	1,802	0.82
1960	2,194	32	328	1,834	0.84
1961	2,277	32	294	1,951	0.86
1962	2,262	31	263	1,968	0.87
1963	2,173	31	236	1,906	0.88
1964	2,106	30	212	1,864	0.89
1965	2,171	30	189	1,952	0.90
1966	2,122	30	165	1,927	0.91
1967	2,144	29	154	1,961	0.91
1968	2,115	28	143	1,944	0.92
1969	2,104	28	132	1,944	0.92
1975	2,031	54	60	1,917	0.94
1976	2,096	51	58	1,987	0.95
1977	2,181	49	55	2,077	0.95
1978	2,073	48	49	1,976	0.95
1979	2,091	48	47	1,996	0.95
1980	2,241	40	45	2,156	0.96
1981	2,300	40	44	2,216	0.96
1982	2,326	44	46	2,236	0.96
1983	2,250	41	43	2,166	0.96
1984	2,152	110	35	2,007	0.93
1985	2,235	118	35	2,082	0.93
1986	2,221	104	30	2,087	0.94
1987	2,207	145	30	2,032	0.92
1988	2,137	123	25	1,989	0.93
1989	2,040	90	20	1,930	0.95
1990	2,022	90	25	1,907	0.94
1991	1,993	90	20	1,883	0.94
1992	1,968	90	15	1,863	0.95
1993	1,945	90	15	1,840	0.95
1994	1,780	45	5	1,730	0.97
1995	1,745	9	1	1,735	0.99
1996	1,617	11	1	1,605	0.99

Table 12-A.7 The areas of the counties affected by the atmospheric releases of <sup>131</sup>I from X-10 (USDA, 1950).

County of Interest	Size of County (Acres)	Size of County (Square Kilometers)
Anderson	216,320	875
Knox	327,040	1,324
Loudon	153,600	622
Roane	226,560	917
Morgan	344,960	1,396
Blount	370,560	1,500
<b>Total Area</b>	<b>1,639,040</b>	<b>6,633</b>

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